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ANDROID ADVISOR

ISSUE
65



BEST GAMING PHONES 2019

IDG

TESTED:

Samsung Galaxy S10 5G



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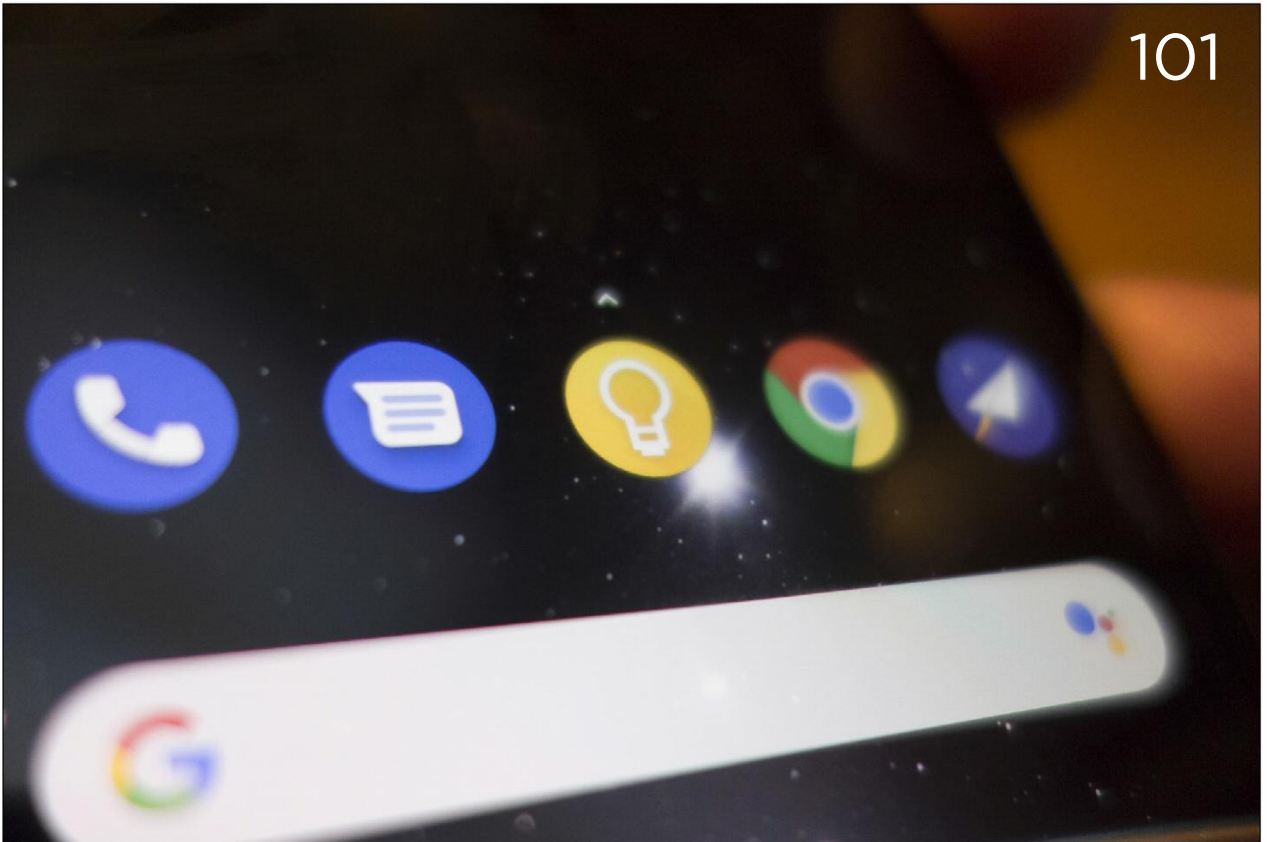
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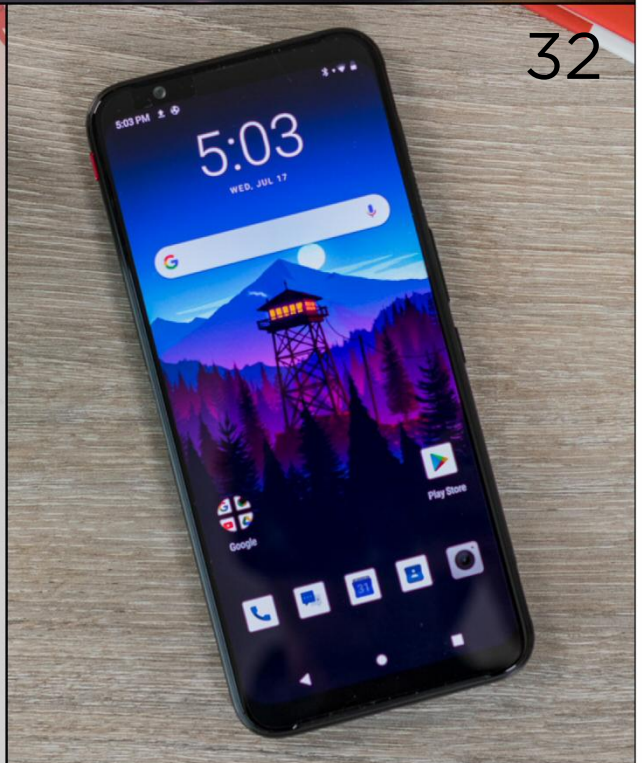


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Samsung Galaxy S10 5G

Price: £1,099 from fave.co/30PqkAD ★★★★★

Samsung just couldn't afford to miss out on 2019's raft of Android smartphones with '5G' at the end of its already convoluted S10 product names. Meet the Samsung Galaxy S10 5G.

Unlike the OnePlus 7 Pro 5G and Oppo Reno 5G that are physically identical to their 4G versions, the S10 5G is a different phone altogether. It has a larger screen, bigger battery and an extra camera in comparison to the S10+.

Does that mean it's worth the asking price of over a grand or a high-cost contract in the UK? I tested

the S10 5G on Vodafone's sparkly new 5G network to determine whether it's worth it or whether you should a cheaper, still excellent, regular S10 or S10+.

Price

The S10 5G is available direct from Samsung for £1,099 locked to either Vodafone or EE in the UK. This gets you 256GB storage and a phone in silver or black.

Vodafone offers the S10 5G from £72 per month and £29 up front at fave.co/30VkJZw. EE's prices start at £69 per month – see fave.co/32MoOBd. It's the most expensive monthly EE plan for a 5G phone, with the Oppo Reno 5G the cheapest at £49 a month.

If you're comparing the phone to the 4G line-up of S10 devices then the S10+ costs a full £300 less. It has a slightly smaller display and battery, one less camera and 4G connectivity.

Bigger, but is it better?

The S10 5G is a large phone with a 6.7in display, but boy oh boy does that display look incredible. As long as you're not irked by the two cameras in the cut-out at the top right, then it's practically bezel-less too.

Perhaps it's because I have become used to large phones, but even with my small hands I didn't find it too enormous, something I can't say for the OnePlus 7 Pro.

That said the screen does lack the 90Hz refresh rate of the 7 Pro, but Samsung's is right up there with OnePlus in terms of vibrancy, colour and viewing angles. It's also the best phone screen for viewability in direct sunlight, there's no competition.

My review unit of the S10 was crown silver, which is a half matte half gloss finish. It looks great with hints of pink and blue, while hiding more fingerprints compared to the black model.

Samsung has nailed the right amount of curvature to the edge of the S10 5G, meaning despite the lack of bezels there is still a rim to hold onto. That rim also has a headphone jack, meaning the S10 and LG V50 ThinQ 5G are the only two 5G phones in the UK to have one. AKG headphones in the box with the S10 sweeten the deal, too and the dual stereo speakers are plenty loud without distorting.

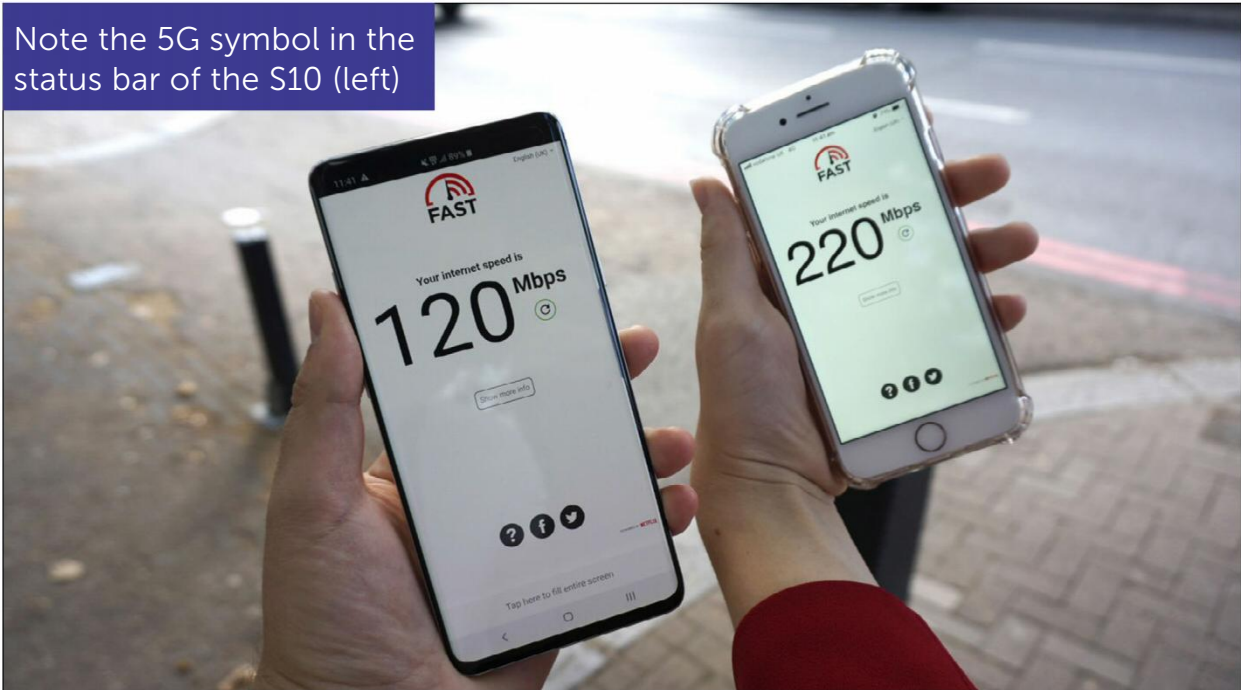
This is my personal favourite design of all the 5G phones on the market currently as I'm not a huge fan of the pop-up cameras of the OnePlus, Oppo and Xiaomi options. I also like that the S10 5G has improved hardware (screen, battery, cameras) over the 4G versions, something not true of any other current 5G phone.

Ain't nuthin but a 5G thang

Now, why do you need 5G? It's at a premium in 2019 and is nowhere near being available countrywide. Vodafone launched in Birmingham, Bristol, Cardiff, Glasgow, Liverpool, London and Manchester. Latterly it has extended it to more towns, including Wolverhampton, Stoke and Plymouth.

I tested the network with the S10 5G in London where Vodafone recommended only three specific areas where I'd find the best connection, not exactly attractive for most people given the price. The same is the case for every included city – none

Note the 5G symbol in the status bar of the S10 (left)



has anywhere near blanket coverage. You can check Vodafone's 5G coverage here using postcode search – fave.co/32KvKPr.

My experience of 5G on the Galaxy S10 5G was more varied than I found on EE's network using the OnePlus 7 Pro. I went to Pentonville Road between King's Cross and Angel in London where the coverage checker said I'd find 5G. I did indeed, but found that an iPhone 8 on Vodafone's 4G network got a whole 100Mb/s better connection than the S10 on a 5G connection – see the image above.

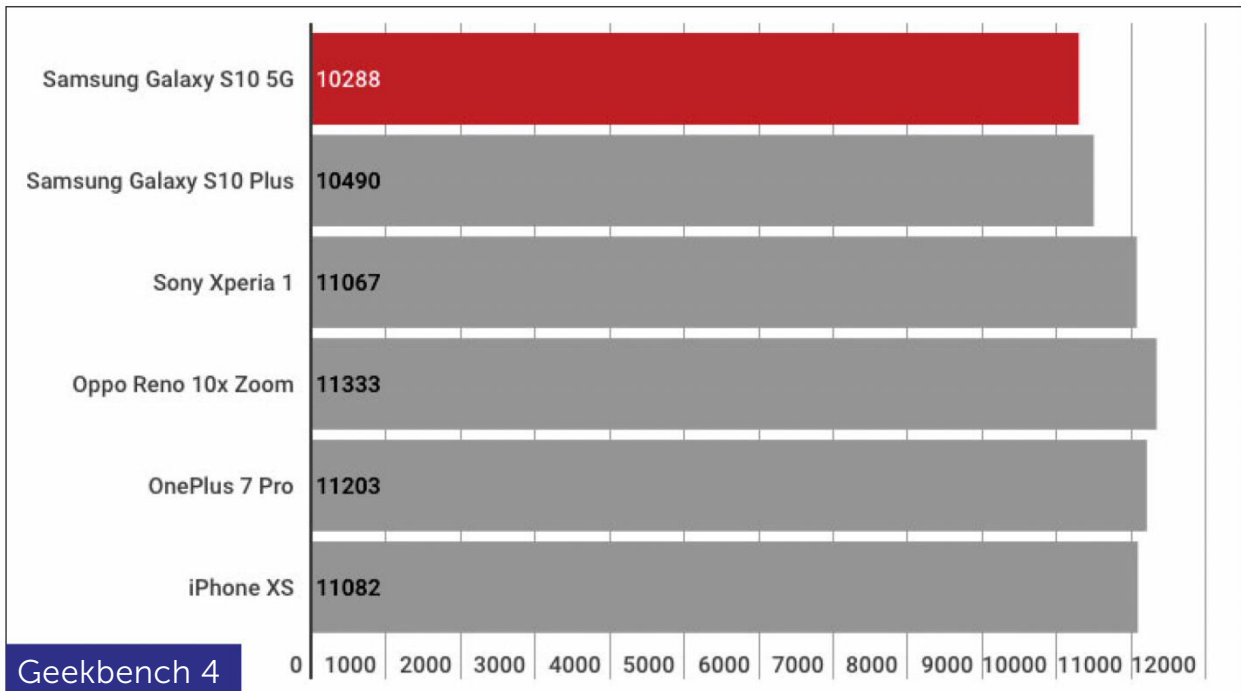
EE's 5G connection was always faster than a 4G connection when compared, whereas Vodafone's was inconsistent. It was slower when on 5G (above) compared to a phone on a 4G plan, but then faster than that same 4G phone when on a 4G connection itself (overleaf).



Vodafone's 4G network is quick in these 5G areas, and I can't recommend the extra spend in order to hop onto the 5G network at this stage. The benefits are not worth the extra spend on the contract. I also found that I had to stand in the exact spots Vodafone told me to be, otherwise I never saw a 5G connection. EE's coverage in London seems wider already.

But the fact you have a 5G capable phone does mean that you will generally get a faster 4G signal in certain areas. This is not because normal 4G contracts are throttled by Vodafone, but rather the 5G masts the S10 5G can access have fewer people connecting to them given 5G's infancy. This means the 4G those masts broadcast are also being used by fewer people, so the 4G connection is faster.

That said, this is also true of EE, where I found speeds to be consistently faster. Of course, this is only



my experience of 5G in my city, but is representative of the young technology and its inconsistencies.

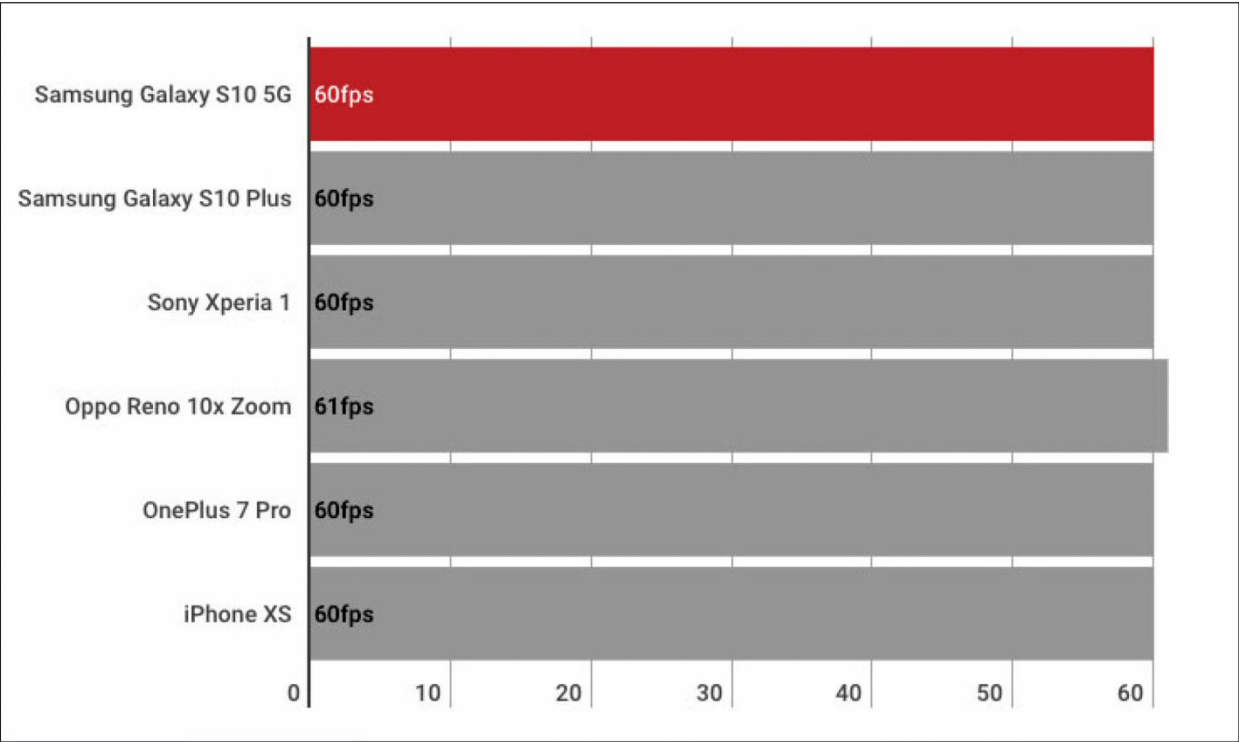
Benchmarks

As ever, I benchmarked the S10 5G against similar phones and, unsurprisingly, this is one of the most powerful phones ever made. I had the European Exynos 9820 version, but if you're in America the phone rocks the more energy efficient Qualcomm Snapdragon 855.

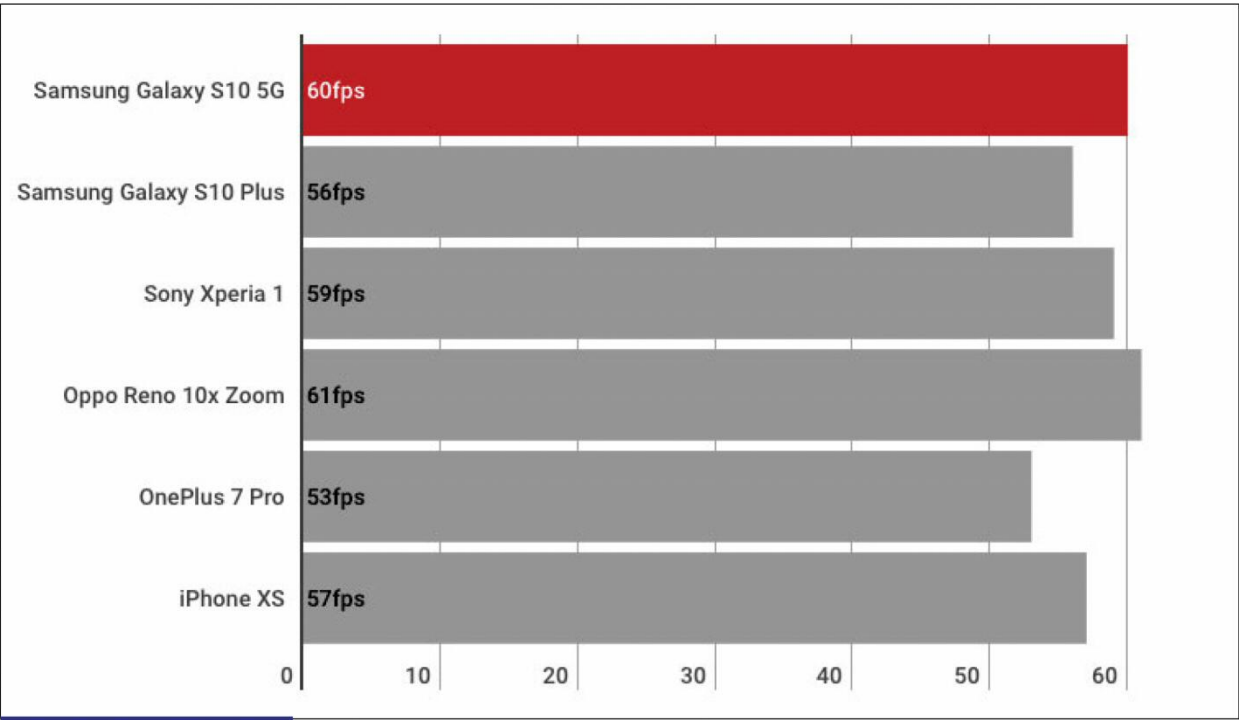
Storage is generous at either 256GB or 512GB while RAM is 8GB for every model. If you want more RAM, you'll have to go for the 4G-only S10+ ceramic version that costs the same £1,099.

As you can see the S10 5G scored some of the best results ever and holds its own next to Snapdragon 855 phones and even the super-fast

REVIEW



GFXBench Manhattan



GFXBench T-Rex

iPhone XS. I experienced zero slowdown in my time with the phone – though Samsung does have a bad track record when it comes to RAM management. Hopefully this phone will be different, but it's something to bear in mind.

Too many lens

The S10 5G has an extra camera on the back compared to the S10 and S10+. As well as the 12Mp main, 12Mp telephoto and 16Mp ultra-wide lenses there's also a time of flight 3D sensor.

This, Samsung says, allows for even better reading of depth, so your portrait mode shots should be even better. The other practical application on the phone is Quick Measure, an AR app that lets you measure objects. It's not the most useful, but means the S10 5G



REVIEW





10 zoom



Low light shot



Selfie shot



Macro shot

can take advantage of any similar app in the Play Store where others can't.

Much like the S10 and S10+, these cameras and incredibly good. The ultra-wide angle is so useful to have, and I missed it when I changed phones. The telephoto lens allows for 2x optical zoom but there's a decent quality 10x digital zoom too.

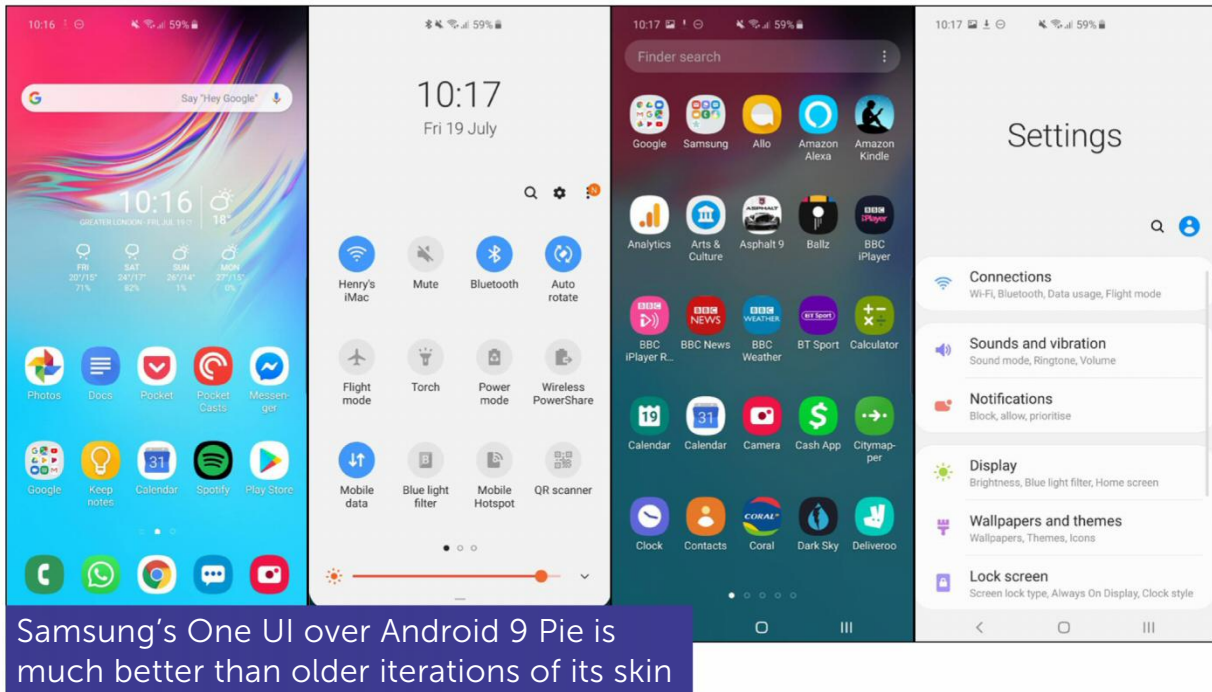
The 10- and 8Mp front facing cameras take decent selfies and adds a 3D depth camera just like the back set of lenses. It's a very versatile setup as long as you don't mind the cut-out design (I don't).

The cameras are outstanding, even if they are practically the same as the S10+. The bokeh effect in live focus mode (what Samsung calls portrait) is quite aggressive, but it's still one of the most versatile and capable smartphone camera setups ever made.

Extra, extra!

The extra cost of the phone is justified not only by the 5G capabilities, but the fact it has every phone feature under the sun. There's IP68 waterproofing, a headphone jack (with AKG headphones in the box), wireless charging and even wireless power-sharing for charging other Qi compatible devices. It's the most fully featured phone you can buy.

The ultrasonic fingerprint sensor is also one of the best on the market and an improvement on the less reliable optical sensors on phones like the OnePlus 6T and 7 Pro. Once I learned the area of the display that it was in, it worked every time and while it's not as accurate as a physical sensor, I prefer it to a rear mounted one.



Samsung's One UI over Android 9 Pie is much better than older iterations of its skins. It's still quite different from stock Android or Google's skin, but I have fallen for its charms. No additions feel unnecessary and little touches like white space at the top of first-party apps, so your thumb can reach the first item on a menu are thoughtful and the system-wide dark mode is great to have.

That said I still prefer the three traditional Android navigation buttons compared to Samsung's gesture system, which uses too many up swipes to be intuitive. The iPhone X series' gestures are still the best and most natural.

Verdict

The Samsung Galaxy S10 5G is not only the best S10 phone, it's one of the best phones you can buy full

stop. It is therefore frustrating that at present you can pretty much only get one on an expensive 5G contract, or SIM free but locked to a network.

Its hardware improvements over the S10+ are subtle enough (screen size, battery size and cameras) to improve it while not turning it into a cumbersome juggernaut of a device.

The cameras are outstanding, the display is class-leading and the crown silver model is one of the best-looking smartphones out there. This is a truly outstanding device, so it's a tad frustrating that it's only a 5G phone as it stands – as most people shouldn't fork out for a 5G contract until the coverage is country-wide. **Henry Burrell**

Specifications

- 6.7in (3,040x1,440; 502ppi) dynamic AMOLED capacitive touchscreen
- Android 9.0 (Pie), One UI
- Exynos 9820 (8nm) processor
- Octa-core (2x 2.73GHz Mongoose M4, 2x 2.31GHz Cortex-A75, 4x 1.95GHz Cortex-A55) CPU
- Mali-G76 MP12 GPU
- 8GB RAM
- 264GB/512GB storage
- Four rear-facing cameras: 12Mp, f/1.5-2.4, 26mm (wide), 1/2.55in, 1.4µm, Dual Pixel PDAF, OIS; 12Mp, f/2.4, 52mm (telephoto), 1/3.6in, 1.0µm, AF, OIS, 2x optical zoom; 16Mp, f/2.2, 12mm (ultrawide)
- Front-facing camera: 10Mp, f/1.9, 26mm (wide), Dual Pixel PDAF
- Dual-band 802.11acx Wi-Fi



- Bluetooth 5.0
- A-GPS, GLONASS, BDS, GALILEO
- NFC
- Fingerprint scanner (under the display)
- USB 3.1, Type-C 1.0 reversible connector
- Non-removable 4,500mAh lithium-ion battery
- 162.6x77.1x7.9mm
- 198g



Xiaomi Mi 9T

Price: £293 from fave.co/2y2ZzfV ★★★★★

The Mi 9T has a lower price and, arguably, a more balanced specification than other Mi 9 models, losing the flagship processor and wireless charging of the standard Mi 9, but retaining its in-display fingerprint sensor and adding a higher-capacity 4,000mAh battery.

It uses the same 48Mp triple-lens camera as the Mi 9 SE, but at the front is fitted with a 20Mp pop-up selfie camera that enables a truly full-screen experience on its 6.39in Full-HD+ AMOLED display.

Price

A rebadged Redmi K20 Pro, the mid-range Mi 9T is now official in Spain, France and Italy, but has not yet been announced in the UK. Xiaomi has not confirmed if or when it will launch here. UK users can get hold of the Mi 9T through GearBest, however, where it costs £293 for the 64GB model and £322 for 128GB. Bear in mind that GearBest uses both Chinese and European warehouses, and if your order is shipped from the former you will be liable for import duty if requested (20 percent of the value on the shipping paperwork).

Choose carefully which storage option you plump for, since there is no possibility to expand this later through microSD.

Design

While all Xiaomi phones have a familiar look and feel, the Mi 9T is quite a departure from the Mi 9 line. Both its siblings feature a small 'Dot Drop' notch at the top of the screen, but the 9T is all display thanks to its inclusion of a pop-up selfie camera. The earpiece remains just above the top screen bezel, but is around half the width and all but unnoticeable.

At the sides you'll find the same red power button as we saw on the Mi 8 Pro, not seen in the Mi 9 or Mi 9 SE – and this colour scheme extends to the rear where it is used to pick out the 48Mp lens, as well as the selfie camera at the front. The camera setup itself looks different, too, with the primary lens separated from the 13Mp and 8Mp duo. All are centrally located and don't jut out from the frame as much as we see in other Mi 9 models.

In placing the pop-up mechanism and headphone jack at the top of the phone Xiaomi has had cause to move the SIM slot to the phone's bottom edge, where it sits to the left of the USB-C port. To the right of this is a grille that conceals a decent mono speaker. Xiaomi has also removed the IR blaster found in other Mi 9 models, and in common with the Mi 9 SE there's no dedicated button for calling up Google Assistant.

Both Mi 9 and Mi 9 SE use an attractive 'holographic' glass cover at the rear, which appears to change colour as you move it in the light. Mi 9T also has Glacier Blue and Flame Red holographic options, though the Carbon Black review sample we have here has a carbon-fibre finish. It looks like a truly premium handset, despite its mid-range price.

Since Xiaomi has fitted a higher-capacity battery the Mi 9T naturally has a thicker chassis than its



siblings, but you'll find the edges are more aggressively curved than on the Mi 9 at the rear, and significantly more so than on the virtually flat-back Mi 9 SE. At 198g and 8.8mm thick it does feel reasonably weighty, but it's not too much in our opinion.

The Mi 9T stands out for its 6.39in full-display, an AMOLED panel that supports a Full-HD+ resolution of 2,340x1,080 pixels and a tall 19.5:9 aspect ratio. This is our favourite kind of screen technology, allowing for vivid colours and rich, deep blacks. It has a fingerprint sensor built directly into it, which worked well in our tests thanks to its larger detection area. Xiaomi claims its scanner can recognize fingerprints 25 percent faster than previously.

It's the same size display as on the standard Mi 9, though obviously has a greater screen area without the notch – there's a 91.7 percent screen-to-body ratio, according to Xiaomi. Mi 9 SE is only slightly smaller at 5.97in, but even though we're talking about less than half an inch it makes a real difference to how the phone feels in the hand.

Mi 9T also supports Xiaomi's newly customizable Always-on ('Ambient') display, but this is switched off by default to preserve battery life. In truth it consumes only a fraction of the phone's power, and is actually designed to save battery power with you waking the screen less frequently to check the time or for notifications. Given that there's no notification LED, we'd recommend switching it on.

Our only real issues with the design concern how slippery the glass can be (less so if you use the supplied silicone case), and how easily the Mi 9T picks

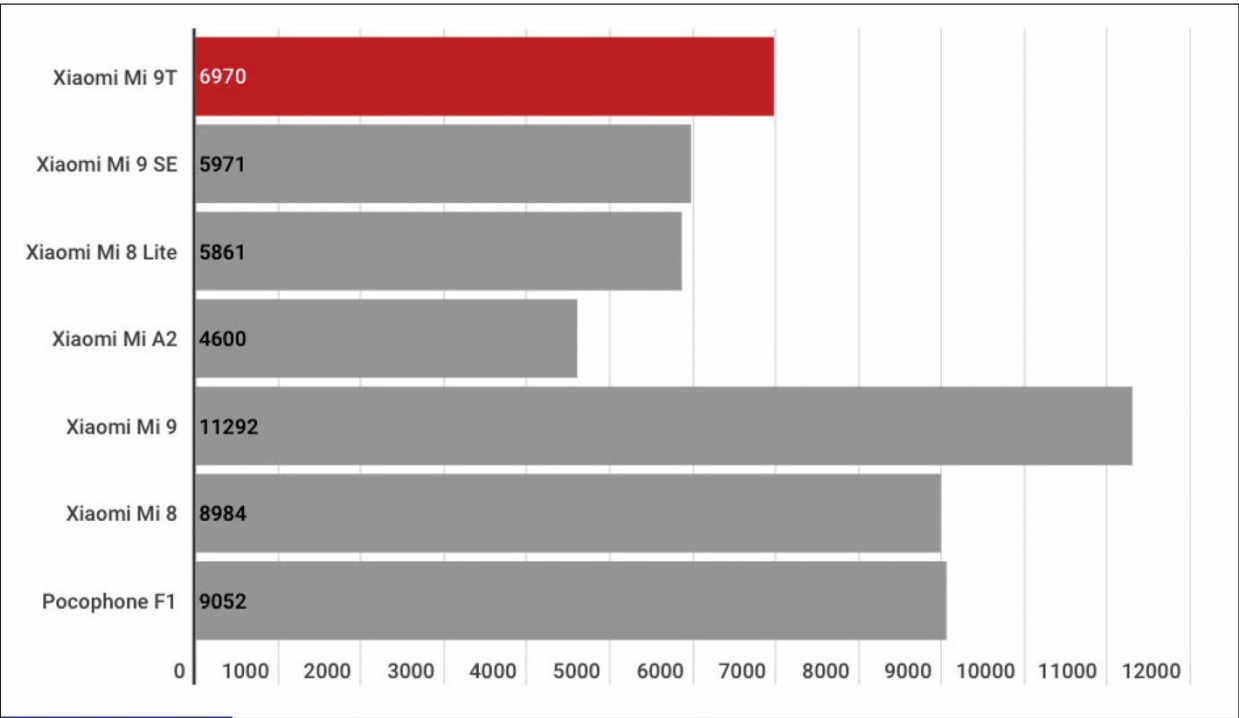
up fingerprints. There's also no waterproofing, though this is yet to be found in any Xiaomi phone to date.

Performance

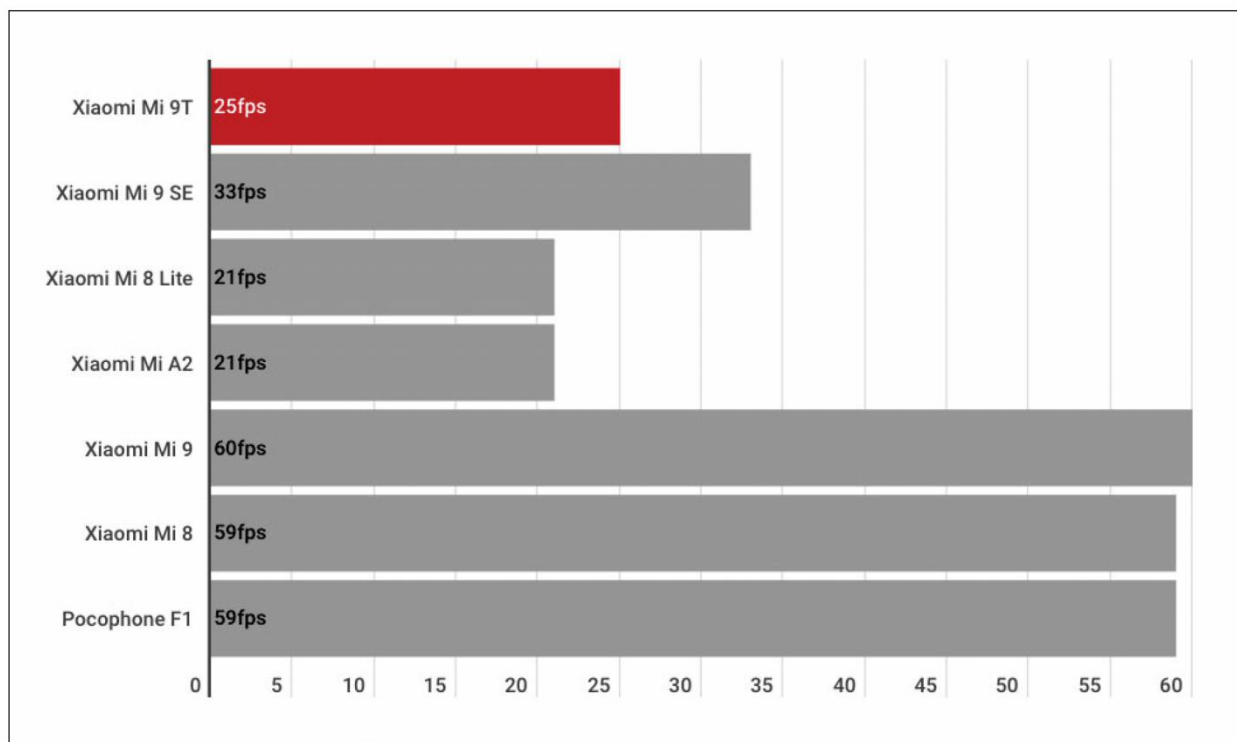
Mi 9T offers very capable performance at this price point, and is the first handset to run Qualcomm's Snapdragon 730 – an upgrade over the Snapdragon 712 found in the Mi 9 SE, though a sizeable step down from Mi 9's 7nm Snapdragon 855.

This is an 8nm octa-core chip running at 2.2GHz and integrated with the Kryo 470 CPU and 610MHz Adreno 618. It's also paired with 6GB of memory.

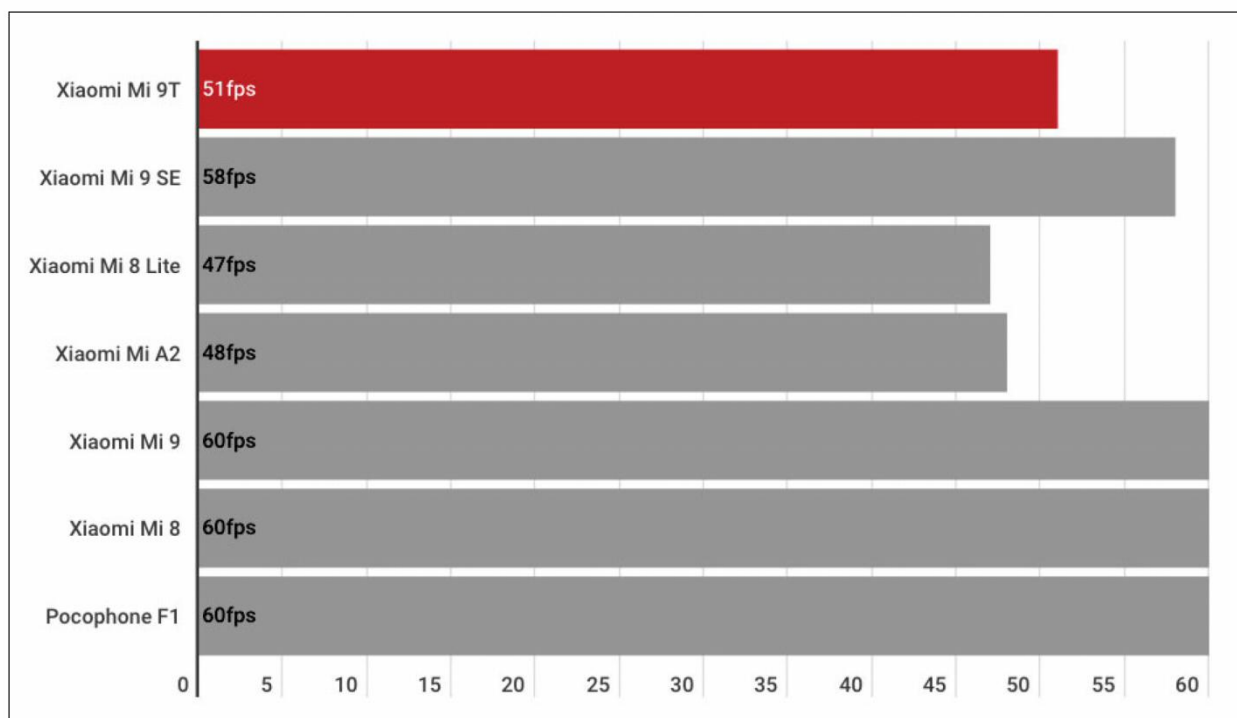
We ran our usual benchmarks and found strong performance for a mid-range market. In Geekbench 4 it recorded 6,970 points multi-core, which is faster than the Mi 9 SE and many better known UK phones



Geekbench 4



GFXBench Manhattan



GFXBench T-Rex

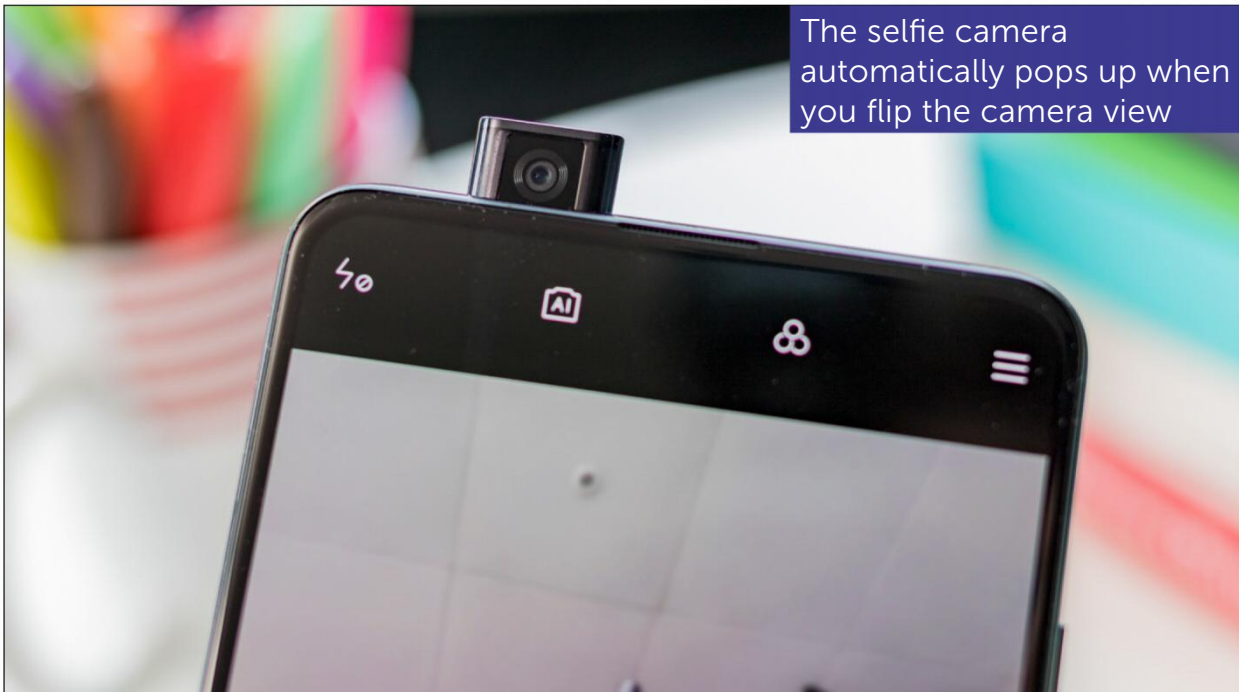
at this price point. We also ran the GFXBench graphics test, and the Mi 9T proved itself more than able to handle some casual gaming, recording 51fps in T-Rex, 25fps in Manhattan, 18fps in Manhattan 3.1, and 10fps in Car Chase. That's a fraction slower than Mi 9 SE, though it has more pixels to push.

In AnTuTu, Mi 9T recorded 210,725 points against the Mi 9 SE's 179,500. For battery life the Mi 9T is the best in the line, thanks to its higher-capacity battery. We recorded 11 hours 12 minutes in the Geekbench 4 battery test, which is a very good score. How long it actually lasts in the real world is down to your personal usage, but all-day battery life is not a pipe dream for Mi 9T. When the battery runs down there's support for 18W fast charging, mirroring the Mi 9 SE.

Connectivity

Recently, we were disappointed to learn that Xiaomi's recently announced mid-range Android One phone, the Mi A3, does not support NFC, which is necessary for making mobile payments. Mi 9T has this covered, along with most other connectivity bases – as we mentioned earlier it does not have the IR blaster found on Mi 9 and Mi 9 SE, though it adds a headphone jack while they both rely on USB-C for personal audio.

You'll also find Bluetooth 5.0, dual-band 802.11ac Wi-Fi, GPS and, interestingly, dual-4G. The Mi 9T, like the rest of the line, is a dual-SIM phone, and whereas some such phones allow data on only one SIM slot, here you can use either. Do note that this is not a hybrid slot, so there's no storage expansion through microSD.

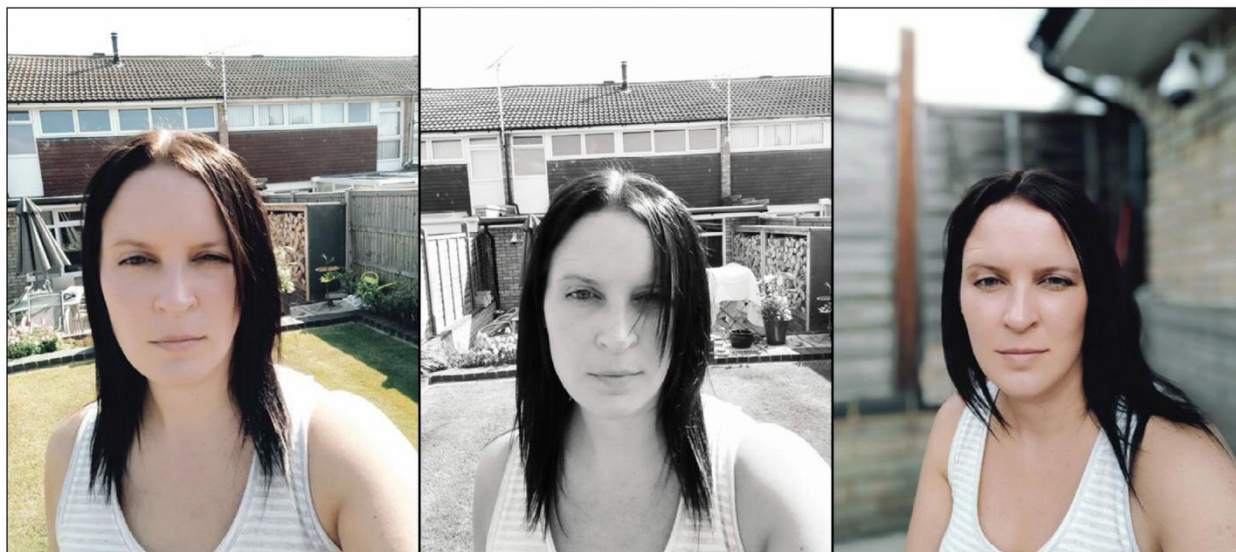


Cameras

With the same primary camera as Mi 9 SE, the pop-up selfie camera is arguably more interesting here. It automatically pops up when you flip the camera view, and is clever enough to retract itself should it detect a drop or downward pressure. Xiaomi says the mechanism is good for 300,000 cycles.

Even with camera sounds switched off the selfie camera sounds a notification when opened or closed, which could be slightly annoying when you're trying to sneak a selfie with no-one noticing.

Naturally, it takes a little longer to pop up a selfie camera than it does to switch to a traditional version, and this is potentially good and bad – it gives you a little longer to perfect your pose, but it can also feel like a bit of a drag. The latter is amplified if you want to check a preview of your photo in the Gallery



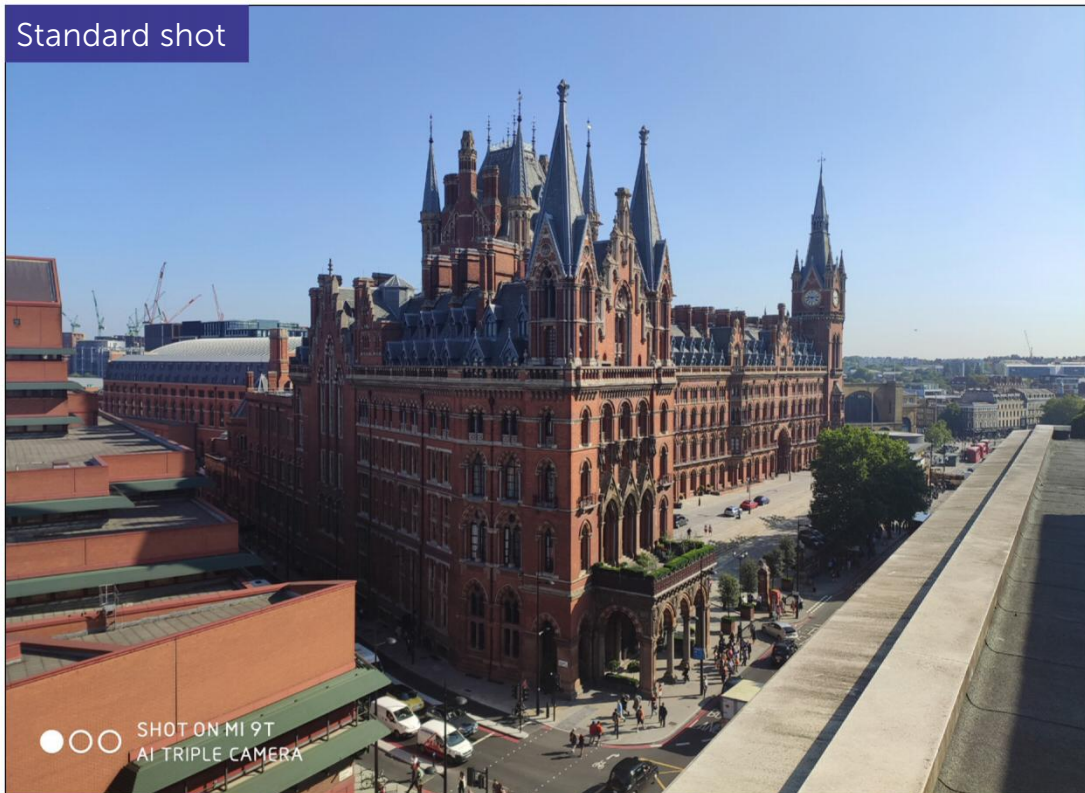
There's some obvious skin softening in use here

before taking another portrait shot, since every time you exit the camera view it will automatically retract the camera.

In selfie mode you can choose between the ordinary Photo mode, Portrait, which allows for bokeh-effect blurred background shots, Panorama, which lets you take group selfies without everyone getting into awkward positions, Video and Short Video. The main camera adds a Slow motion mode that can shoot video at 960fps, in addition to 4K at 30fps with image stabilization.

By default there's some obvious skin softening in use here, but there are five Beauty presets to choose from, and sliders for just about everything, from the shape of your face to the size of your eyes. You can even apply little sparkly stars to your eyes (but don't, because they look silly), or apply real-time filters such as Movie or Sepia.

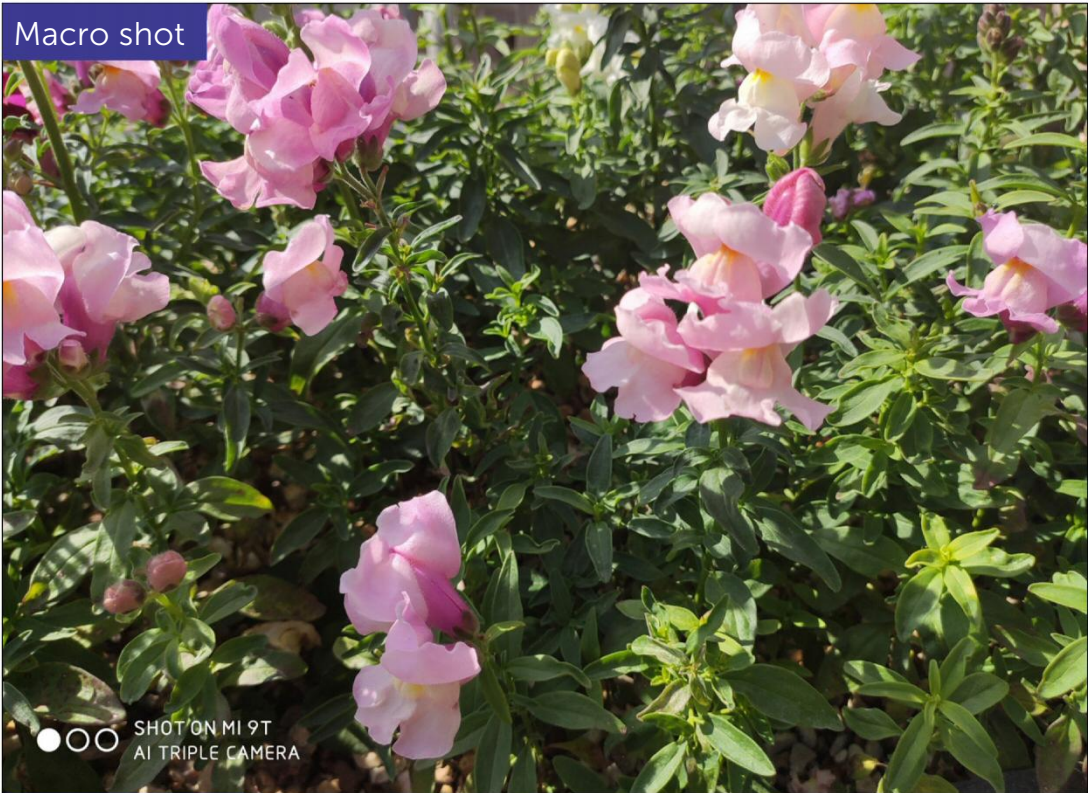
Standard shot



Portrait shot



REVIEW



This is an AI camera, which means it intelligently selects the best presets for the shot. The primary camera also integrates this intelligent tech, but in both cases it's something you have to trust is working as it's not obvious what scene mode the camera has selected.

As on the Mi 9 SE then, the primary lens is a wide-angle 48Mp (f/1.75, 1.6µm) Sony IMX582. It's joined by 13Mp (f/2.4, 1.12µm) ultra-wide-angle and 8Mp (f/2.4, 1.12µm) telephoto sensors.

It is possible to shoot images at 48Mp resolution, though by default the Mi 9T combines four pixels into one, resulting in a higher-quality 12Mp shot.

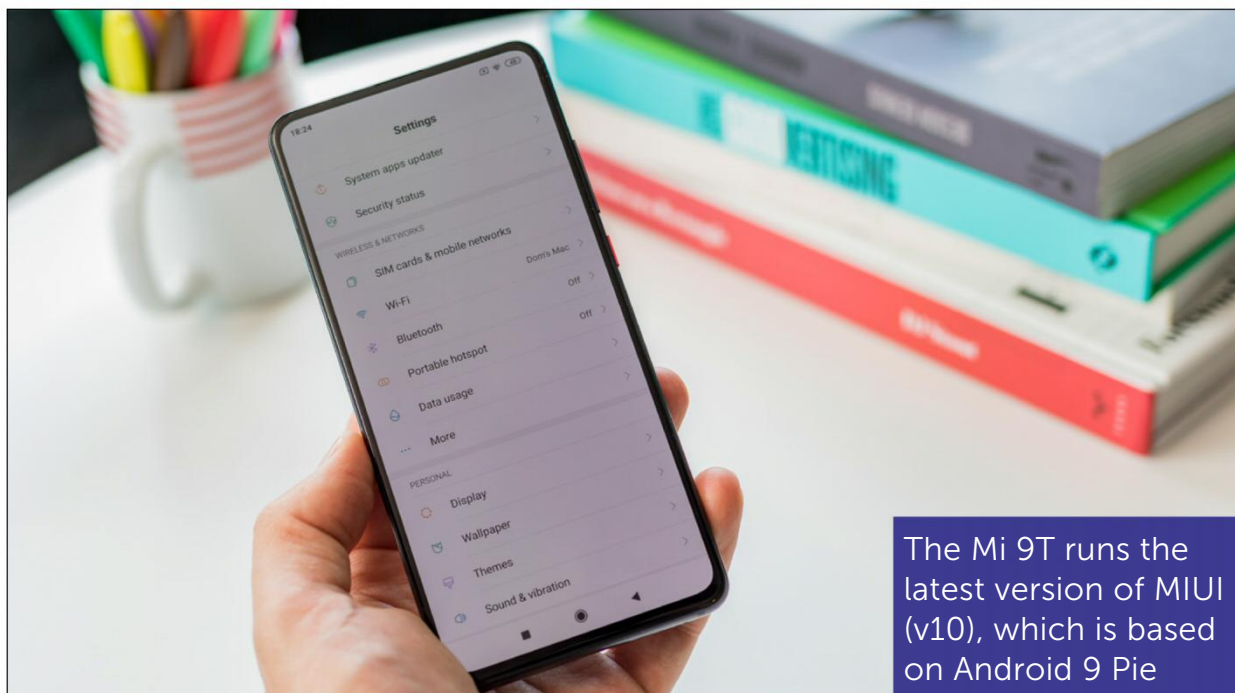
In good light the quality is excellent, with great exposure, natural colours and sharp detail. It also performs reasonably well in low light.

Software

The Mi 9T runs the latest version of MIUI (v10), which is based on Android 9 Pie. We like this interface and find it quick and easy to move between settings and open and close apps, though if you're used to standard Android you will find it rather different.

The most obvious difference is the lack of an app tray, but the Settings menu can also feel unfamiliar in places, and you'll find plenty of Xiaomi's own apps. This is because Google's services are not used in China, though they are pre-installed here given that the Mi 9T is running the Global ROM.

Some of these extra apps and features are genuinely useful, for example Second Space and Dual Apps. We also like the system-wide Dark Mode, which



The Mi 9T runs the latest version of MIUI (v10), which is based on Android 9 Pie

is not yet a standard feature of Android. Anything you don't like you can tuck away in a folder out of sight, since there's plenty of storage here by default.

You can choose to use the Mi 9T with either on-screen buttons (the usual home, back and recents) or in full-screen mode with gesture navigation. Though we liked the latter we were less keen on how you manage notifications in this mode, and often found the phone unresponsive when pulling down from the top of the display.

Verdict

The cheapest model in the Mi 9 series, yet the only one to include a full-screen display, a headphone jack and a 4,000mAh battery, Mi 9T certainly has its merits. We can handle losing the wireless charging and IR blaster in return for a cheaper price, and note

that it offers capable performance in the mid-range, slightly faster than the Mi 9 SE. It's a little on the heavy side but still beautiful. A great buy at this price, and we're hopeful it will become officially available in the UK soon. **Marie Black**

Specifications

- 6.3in (2,340x1,080; 403ppi) AMOLED capacitive touchscreen
- Android 9.0 (Pie), MIUI 10
- Qualcomm SDM730 Snapdragon 730 (8nm) processor
- Octa-core (2x 2.2GHz Kryo 470 Gold, 6x 1.8GHz Kryo 470 Silver) CPU
- Adreno 618 GPU
- 6GB RAM
- 64GB/126GB storage
- Three rear-facing cameras: 48Mp, f/1.8, 26mm (wide), 1/2in, 0.8µm, PDAF; 8Mp, f/2.4, 53mm (telephoto), 1/4in, 1.12µm, PDAF, 2x optical zoom; 13Mp, f/2.4, 12mm (ultrawide), 1/3in, 1.12µm
- Front-facing camera: Motorized pop-up 20Mp, f/2.2, 0.8µm
- Dual-band 802.11ac Wi-Fi
- Bluetooth 5.0
- A-GPS, GLONASS, BDS, GALILEO
- NFC
- Fingerprint scanner (under the display)
- USB 2.0, Type-C 1.0 reversible connector
- Non-removable 4,000mAh lithium-polymer battery
- 156.7x74.3x8.8mm
- 191g



Red Magic 3

Price: £419 from fave.co/32O63xq ★★★★★

Following the success of the Red Magic Mars in 2018, the Red Magic 3 looks to take on Razer and Asus for the title of best gaming smartphone – and with impressive gaming-focused features like a 90Hz display and touch-sensitive trigger buttons alongside a budget-friendly price tag, it's certainly a strong contender. We've spent some time gaming on the Red Magic 3, and here's what we think.

Price

This is one of the more budget-friendly gaming-focused smartphones on the market, especially with

premium features on offer. You can buy the phone from the Red Magic site (fave.co/32O63xq), and comes in two variants; an 8GB RAM, 128GB storage variant for £419, or a high-end 12GB RAM, 256GB storage variant for £529. Compared to the likes of the £779 Razer Phone 2 and £799 Asus ROG Phone, the Red Magic 3 certainly offers more bang for your buck.

A focus on gaming

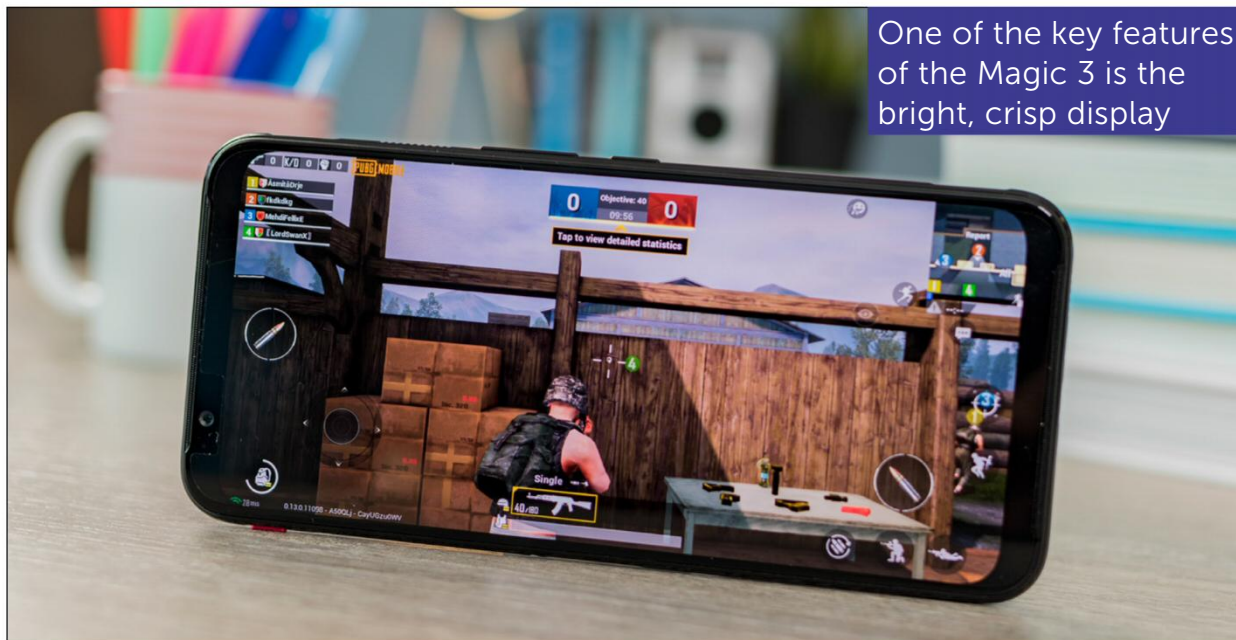
It follows a similar aesthetic to earlier smartphones in the Magic collection, sporting a layered design unique to the brand, along with vents on the sides and rear to improve cooling during intense gaming sessions and, of course, the fan-favourite LED strip.

But while the general design is familiar, there are a number of improvements that make the Red Magic 3 stand out in an ever-expanding market of gaming-focused smartphones.

One of the key features of the Magic 3 is the bright, crisp display; it's 6.65in with a FHD+ (2,340x1,080) resolution and a 19:5:9 aspect ratio, but it's the 90Hz refresh rate that's the real highlight.

While it's not as impressive as the 120Hz display on offer by the Razer Phone 2, it makes a difference not only to gaming but general use too. Scrolling through media-heavy apps such as Twitter and Instagram is noticeably smoother on the Magic 3, and that's due to the combination of the high refresh rate and powerful internals – but we'll go into more detail about the specs later.

Most importantly, it improves the gaming experience and helps give you an edge in online



games such as PUBG Mobile and Fortnite. Admittedly, it'll only give you a split-second more to react than if you were playing with a standard 60Hz smartphone, but that makes all the difference in a competitive environment.

The Magic 3 has a dedicated game mode, activated by a physical switch on the side of the smartphone, that not only improves performance and blocks incoming notifications when playing games, but allows you to use touch-sensitive triggers mounted onto the side of the smartphone, too.

When playing horizontal games, you can program the triggers to any on-screen command – like aiming down the sights and firing in PUBG – and the best part is that because it's all set up via an on-screen overlay, the game doesn't need to offer official controller support. It arguably gives you more of an advantage than the high refresh rate, as it frees up

your thumbs to control movement and aim while your fingers handle the shooting.

In one 4v4 match in PUBG Mobile, we managed to get a 24-kill streak – and we'd describe our skills as average at best.

You'll also notice contact points along the left side of the smartphone. While these can be considered a bit of an eyesore compared to the rest of the smartphone, there's a good reason they're there. If you're serious about mobile gaming, you can pick up the Magic Adaptor for the Mars 3, providing not only a 3.5mm headphone jack, but a Type-C charging port (to keep the phone topped up during intense sessions) and an Ethernet port that should provide a steady 100Mb/s connection.

Much like the Magic Adaptor, gamers can opt to pick up a one-handed controller for the Red Magic 3, transforming it into a proper mobile gaming powerhouse. Unfortunately, we've not had a chance to go hands-on with the Red Magic 3's suite of optional accessories, so we can't comment on build or performance.

Gaming features aside, the Red Magic 3 is a large device – so large, in fact, that we struggle to use it one-handed. It measures in at 171.7x78.5x9.7mm and weighs 215g, and while it's hefty, that's not the issue. We've found that it's simply too tall to use one-handed, with no real way to comfortably reach the top of the screen using our thumb.

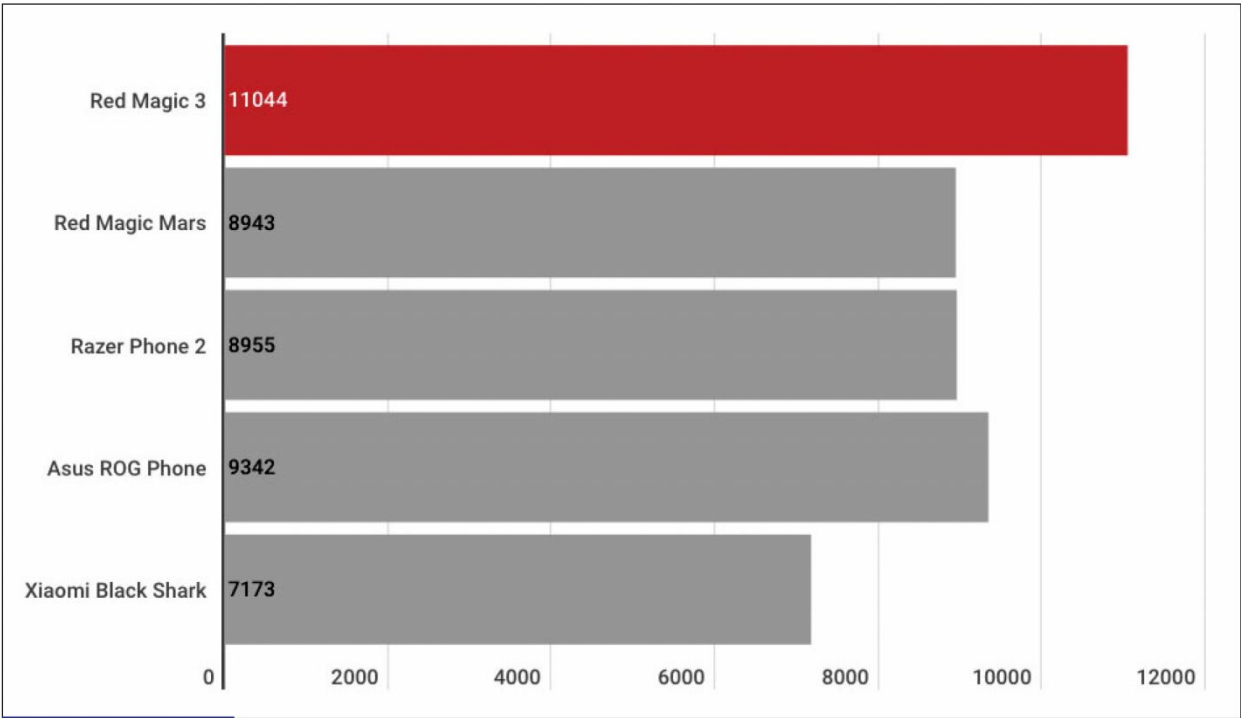
The design gripes don't stop there, either. The display sports rounded corners and has a noticeable forehead and chin. That's not necessarily a bad thing,

REVIEW

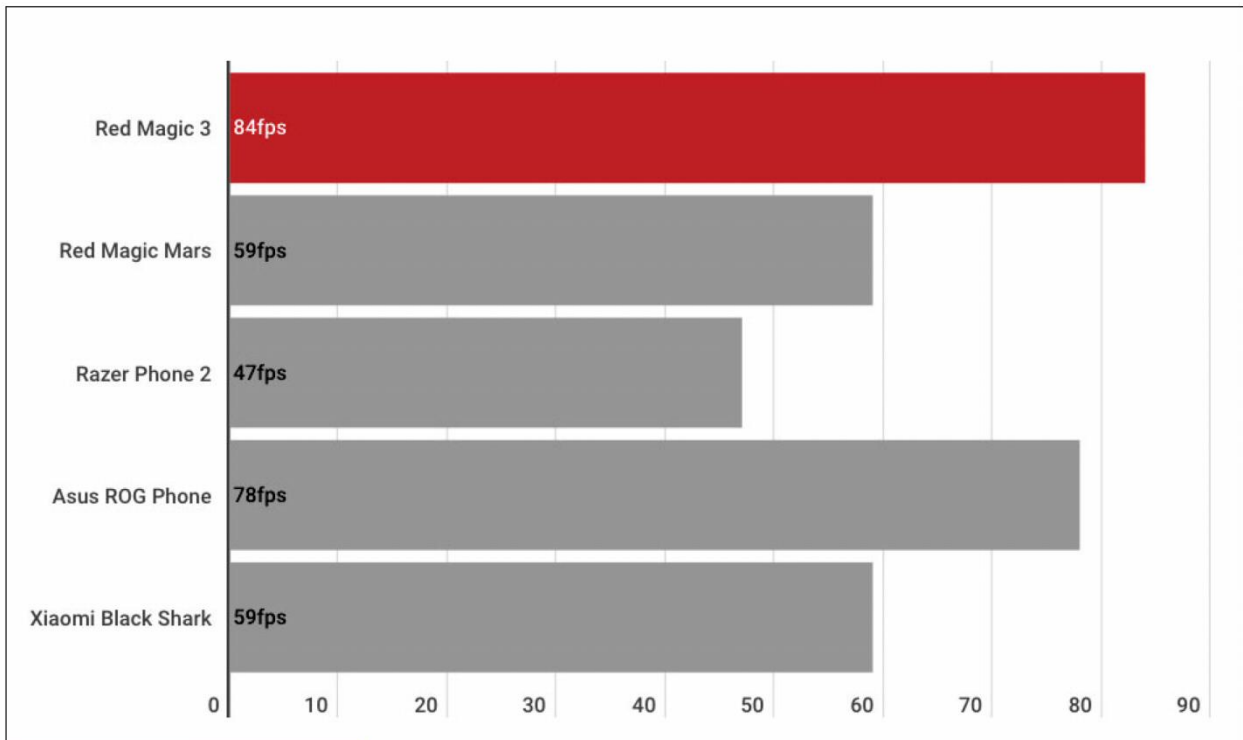
but it does look a little dated compared to the suite of bezel-less smartphones available in 2019. The only saving grace is that the forehead and chin of the smartphone house front-facing stereo speakers that allow you to grip the phone comfortably without blocking audio output.

Premium internals without the price tag

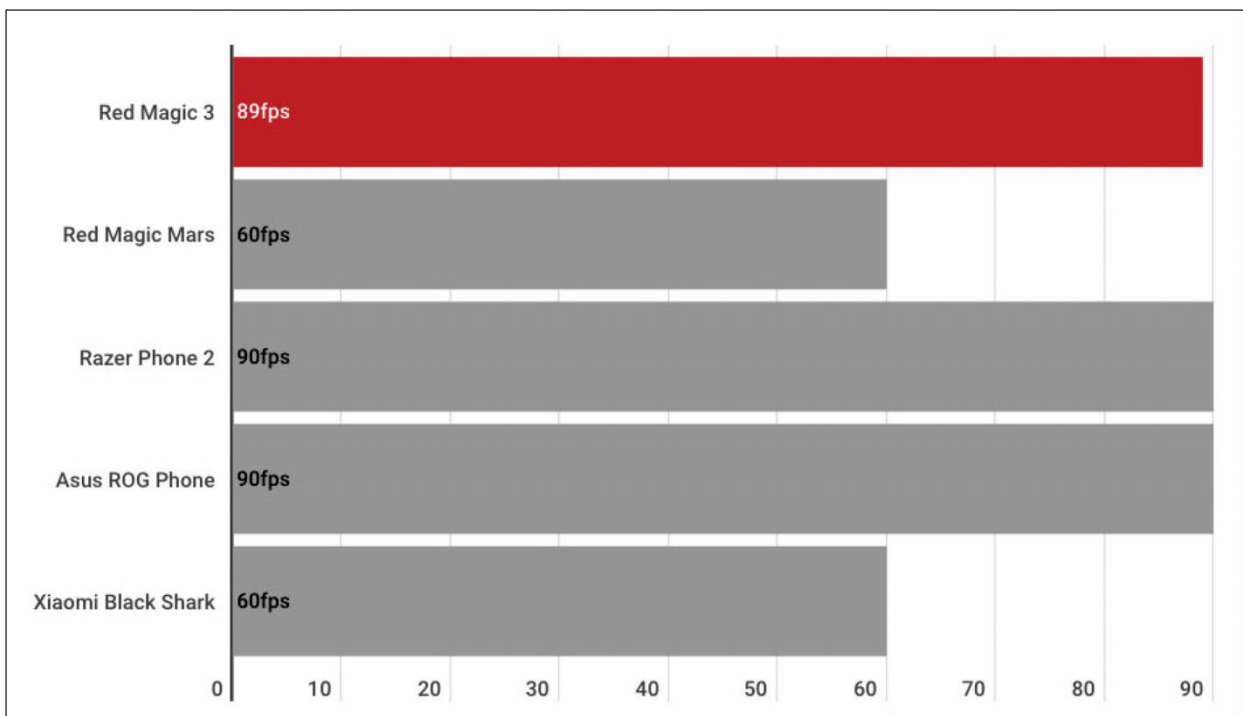
Inside the Red Magic 3, you'll find a Snapdragon 855 chipset and an Adreno 640 GPU. But while that's standard across all variants, the amount of storage and RAM depends on the amount you want to pay. You've got 8GB and 128GB or 12GB and 256GB to choose from, with a price difference of £110. The 12GB option does look tempting, but we doubt that the average gamer would notice the difference in performance.



Geekbench 4



GFXBench Manhattan



GFXBench T-Rex

That performance is, unsurprisingly, impressive. We've not experienced any kind of lag or frame rate drops when using the smartphone to play games, browse social media and take photos. It didn't even break a sweat during a long PUBG Mobile session with graphics set to Ultra, and this is backed up by our benchmark results. For context, we were supplied with the 8GB/128GB variant for review.

It's a similar story in the battery life department, with the Magic 3 boasting a whopping 5,000mAh battery. That's more than enough to get you through the day with about half of the battery remaining. It does admittedly drop down when you spend a lot of time playing games, but the drain is nowhere near noticeable as other smartphones on the market. For context, the Red Magic 3 lasted 11 hours and 46 minutes during our battery test, compared to just 6 hours 27 minutes on offer by the Asus ROG Phone.

When it does come to time to charge, the Red Magic 3 offers 27W fast charge support, although sadly, you don't get a powerful charger in the box.

Oh, and it sports dual-band Wi-Fi alongside Bluetooth 5.0 and GPS, but rather surprisingly, there's no NFC. Those wanting to use Google Pay will have to look elsewhere.

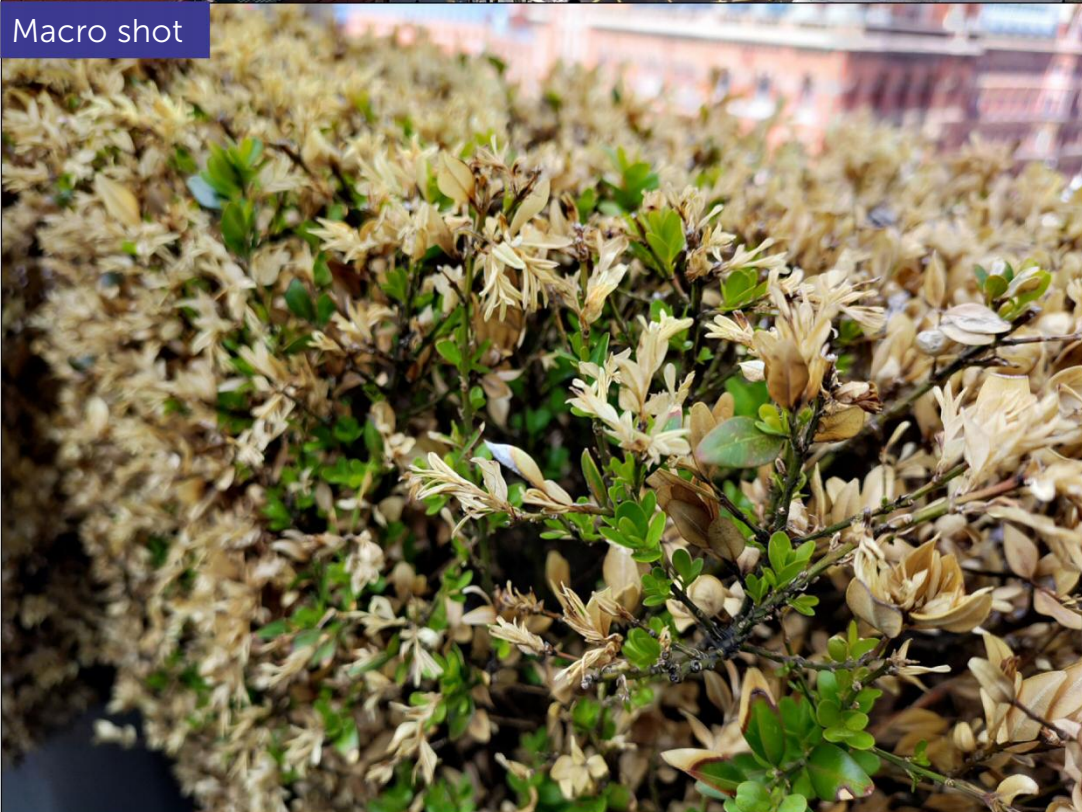
The cameras miss out on the Magic

Cameras are notoriously a weak spot among gaming-focused smartphones, with manufacturers often focusing too much on the gaming aspect and not considering other wants and needs – it's not like gamers hate taking photos, right?

Standard shot



Macro shot



Although there is a solid improvement compared to the Red Magic Mars, the camera offering of the Red Magic 3 is still lacking compared to flagships in 2019. It sports a single 48Mp sensor on the rear, offering f/1.7 alongside a single LED flash and HDR support.

The performance in low-lit environments is surprisingly decent, although it does struggle with areas of extreme light and dark, often blowing out or going too far in the other direction.

Things do improve when taking photos outdoors, producing relatively detailed images, but it lacks the capabilities of modern smartphones – there’s no 2x optical zoom or wide-angle camera on offer, limiting your photography options. There is admittedly a Portrait mode, but without a second camera to detect depth, the results are often hit-and-miss.

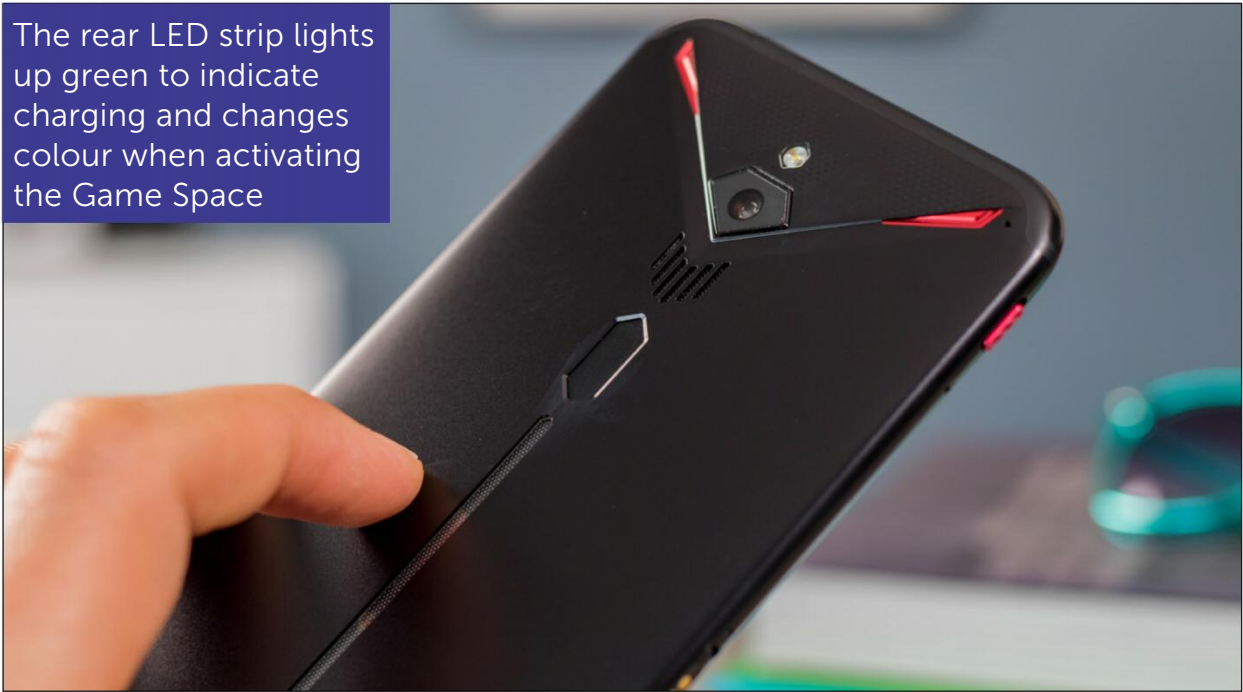
It does offer a suite of video recording modes, ranging from 720p at 30fps to 4K at 60fps and even an experimental 8K at 15fps, although we think the latter is no more than a gimmick. The only real disappointment is that there’s no electronic or optical image stabilization on offer, so videos can come out shaky no matter the resolution you decide to shoot in.

On the front, you’ll find a single 16Mp camera with HDR support and 1080p video recording. It’s good enough for the occasional Snapchat selfie or Instagram post, but it won’t be winning any awards for best front-facing camera anytime soon.

Software

The Red Magic 3 runs Android 9.0 Pie, although with Nubia’s custom OS on-top. After spending

The rear LED strip lights up green to indicate charging and changes colour when activating the Game Space



time with it, we think it's like Marmite; you'll either love it or hate it. It varies between small changes, such as square icons instead of circular, and larger changes, like a custom notification shade and a lack of gesture navigation options.

Beyond that, the UI needs a bit of TLC – especially in the dedicated Game Space – as we've come across chunks of text that are either in broken English or (what we assume to be) Mandarin. Yes, Red Magic isn't as well-known as the likes of Razer and Asus, but to compete you need to focus on the software as well as the hardware.

The biggest disappointment at the time of writing is that the LED strip doesn't really work. It lights up green to indicate charging and changes colour when activating the Game Space, but it doesn't work when playing music, receiving notifications or when there's

an incoming call. We've tweaked the settings and even wiped the phone, so we're awaiting a software update to (hopefully) fix the issue.

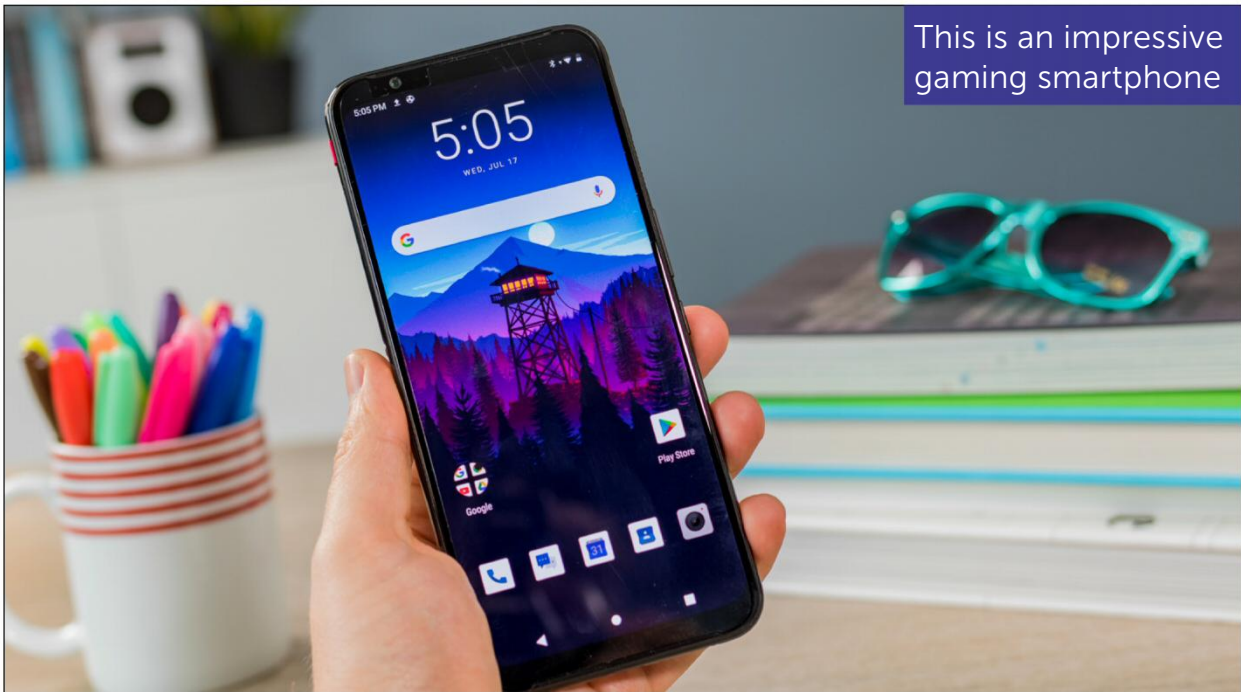
Verdict

The Red Magic 3 is an impressive smartphone tailored towards gamers with features such as touch-sensitive bumper buttons, custom cooling and a 90Hz display that can really provide the upper hand in competitive mobile games like PUBG Mobile and Fortnite. The internals are impressive, especially for the price, and the 5,000mAh battery is more than enough to get you through the day without a top-up.

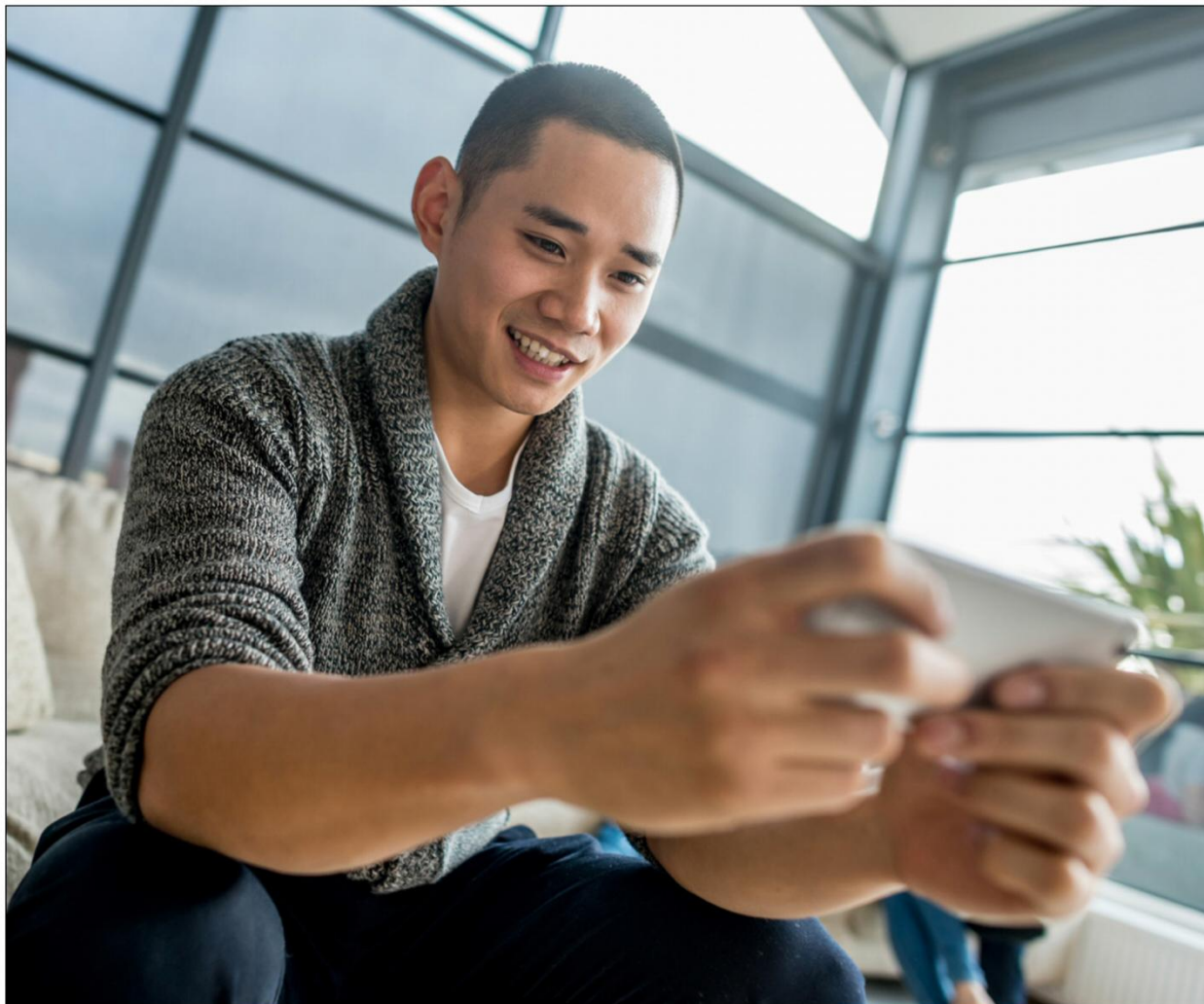
The only area of the Red Magic 3 that needs some attention is the software, which is missing key Android Pie features like gesture navigation, and it even features broken English/Mandarin in certain menus. It's admittedly a small problem considering the price point and what's on offer, but it's worth considering if you're as software-focused as we are. **Lewis Painter**

Specifications

- 6.65in (2,340x1,080; 388ppi) AMOLED capacitive touchscreen
- Android 9.0 (Pie), Redmagic 2.0
- Qualcomm SDM855 Snapdragon 855 (7nm) processor
- Octa-core (1x 2.84GHz Kryo 485, 3x 2.42GHz Kryo 485, 4x 1.8GHz Kryo 485) CPU
- Adreno 640 GPU
- 6GB/8GB/12GB RAM
- 64GB/126GB/256GB storage



- Rear-facing camera: 48Mp, f/1.7, 26mm (wide), 1/2.0in, 0.8µm, PDAF
- Front-facing camera: 16Mp, f/2.0, 2.0µm
- Dual-band 802.11ac Wi-Fi
- Bluetooth 5.0
- A-GPS, GLONASS, BDS, GALILEO
- NFC
- Fingerprint scanner (rear mounted)
- USB 3.0, Type-C 1.0 reversible connector
- Non-removable 5,000mAh lithium-polymer battery
- 171.7x78.5x9.7mm
- 215g



Best gaming phones

Gaming on a smartphone is very much a thing. Here are the best gaming phones you can buy. **ANDROID ADVISOR STAFF** report

From the moment we first booted up our Nokia 3310s to spend hours on Snake, before our smartphones became clogged with Candy Crush Saga, playing mobile games has been a popular pastime. Increasingly, though, handsets are becoming

viable gaming devices alongside home consoles. Indeed, such is their power that sensations such as Fortnite and PUBG can thank modern phones for their ridiculous runaway success. And it's no wonder considering the power inside the best models around.

While the latest Apple and Samsung handsets are capable of running the most demanding mobile games, the market is so popular that there are also dedicated gaming phones such as the Red Magic 3, Asus ROG Phone, Razer Phone 2, OnePlus 7 Pro, and Xiaomi Black Shark.

Do you need all the highest specs?

These handsets often have specialized hardware or even sometimes a built-in controller to help you game better. Internals often have boosts in RAM or the most powerful CPU or GPU to help the phone keep up.

Specifications are pretty important if you want to game to the highest level on a phone, but it does depend on which games you want to run smoothly. If you are more into arcade or puzzle games, then you might not need to splash out on a high-end gaming device.

Below are our top recommendations for the best phones for gaming. Take some time to consider which has the best features at the best price for you, for the games you want to run.

1. Red Magic 3

Price: £419 from [fave.co/32O63xq](https://www.fave.co/32O63xq)

For our full review, go to [page 32](#).

2. Asus ROG Phone

Price: £799 inc VAT from fave.co/2RqtWOk

In many ways, smartphone design has become stagnant and boring, but that's not the case here. The ROG Phone is, as you might expect, eccentric and unconventional. ROG does stand for 'Republic of Gamers' after all. Indeed, the phone has so many striking elements that it's hard to know where to look first. There are unusual shapes everywhere, from the glass around the camera to the rear-mounted fingerprint scanner. Then there's the large lump on the side, complete with exposed copper, which is matched on the front for the stereo speakers. And yes, the iconic ROG logo on the back lights up with customizable Aura RGB lights.

Overall, the device looks great, but you've got to be into this kind of style much like you do with Razer's Phone 2 – they're just very different approaches. Which you prefer is down to personal taste. Opinions at *Android Advisor* towers are split.

What you can't see here is the GameCool 3D vapour-chamber, which helps cool the device. This,

The iconic ROG logo on the back lights up with customizable Aura RGB lights



along with a copper heat spreader, means 47 percent improved CPU cooling efficiency, according to Asus. Those copper bits on the back aren't just for show either, they're air vents.

If that's not enough, the device comes with an AeroActive cooler in the box. This has a fan and clips onto the phone via the slightly ugly looking custom USB port on the side. Not only does it add a controllable fan but USB-C and headphone ports too, so you can stay plugged in without the cable getting in your way while landscape gaming. That's a pretty neat idea and it has a logo that lights up.

Also hidden is a set of 'ultrasonic AirTrigger touch sensors'. Two of these are used for shoulder buttons when landscape gaming while the other is used like the HTC U12 or Pixel 2 XL, so you can squeeze the phone when in regular orientation. They only need a light touch – 20g where others can need four times as much force – and are customizable, so you can



The supplied AeroActive cooler ensures your device doesn't overheat

make the most of them with what matter most to you. For some games, such as PUBG, they're a godsend, while others see less impact. They're not perfect though, as you need a compatible game, and they also don't work well with games that require lots of tapping in a short space of time.

To add an extra dimension to your gaming experience, the ROG Phone also comes with what Asus calls "advanced vibration haptics", so you can feel, for example, whether shots being fired are coming from the left or right.

The handset measures 158.8x76.2x8.3mm, which is roughly the same size as the Razer Phone 2. This is pretty big, plus it weighs 200g. That's more than most smartphones, but understandable considering everything that's going on and we didn't find the weight too much of an issue during our time.

That USB-C port we touched upon earlier can be used to connect the phone to a range of accessories, including a Mobile Desktop Dock, so you can connect to a monitor, keyboard and mouse. There's also a Gamevice controller that lets you stream the phone to your TV via the Asus WiGig dock. This utilizes 11ad Wi-Fi and a TwinView Dock, which works a bit like a Nintendo DS to give you two screens.

Display

A large 6in screen makes sense here, to give you as much gaming real estate as possible. Asus has, however, gone for a different approach to Razer. Instead of a 120Hz LCD panel, the ROG Phone has a 90Hz AMOLED display with a 1ms response time.

We are impressed with display's contrast and colours

During our time with the phone, we found it was silky smooth in use. Note that the refresh rate is set to 60Hz by default.

The screen, like so many now, has an 18:9 aspect ratio and the resolution is Full HD+ (2,160x1,080) resulting in a decent 402ppi. That might be lower than the Razer Phone 2's 2,560x1,440 (513ppi), but it's enough to look perfectly crispy and might even help some games run better. The choice of AMOLED means contrast is better and we're also impressed with both colours and brightness. Furthermore, there's HDR support, so you can get the full experience if you're watching compatible content on a streaming service such as Netflix or Amazon Prime.

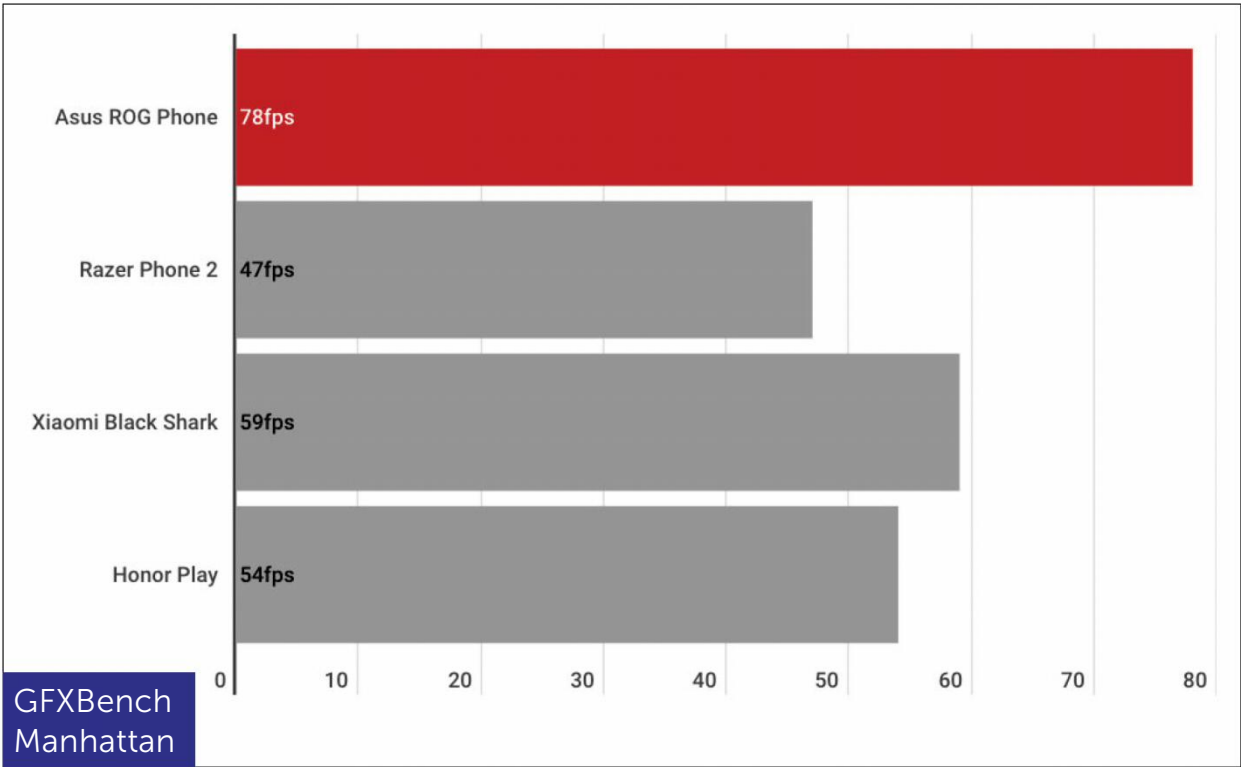
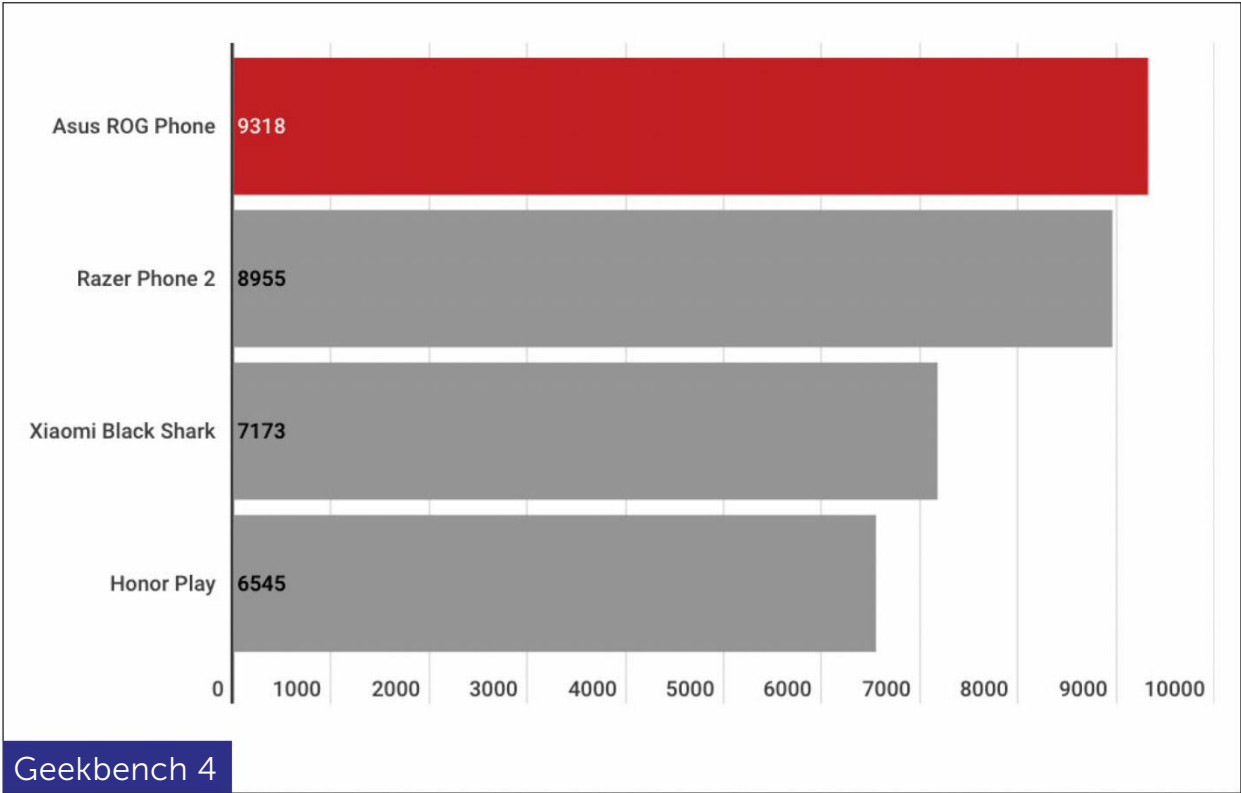


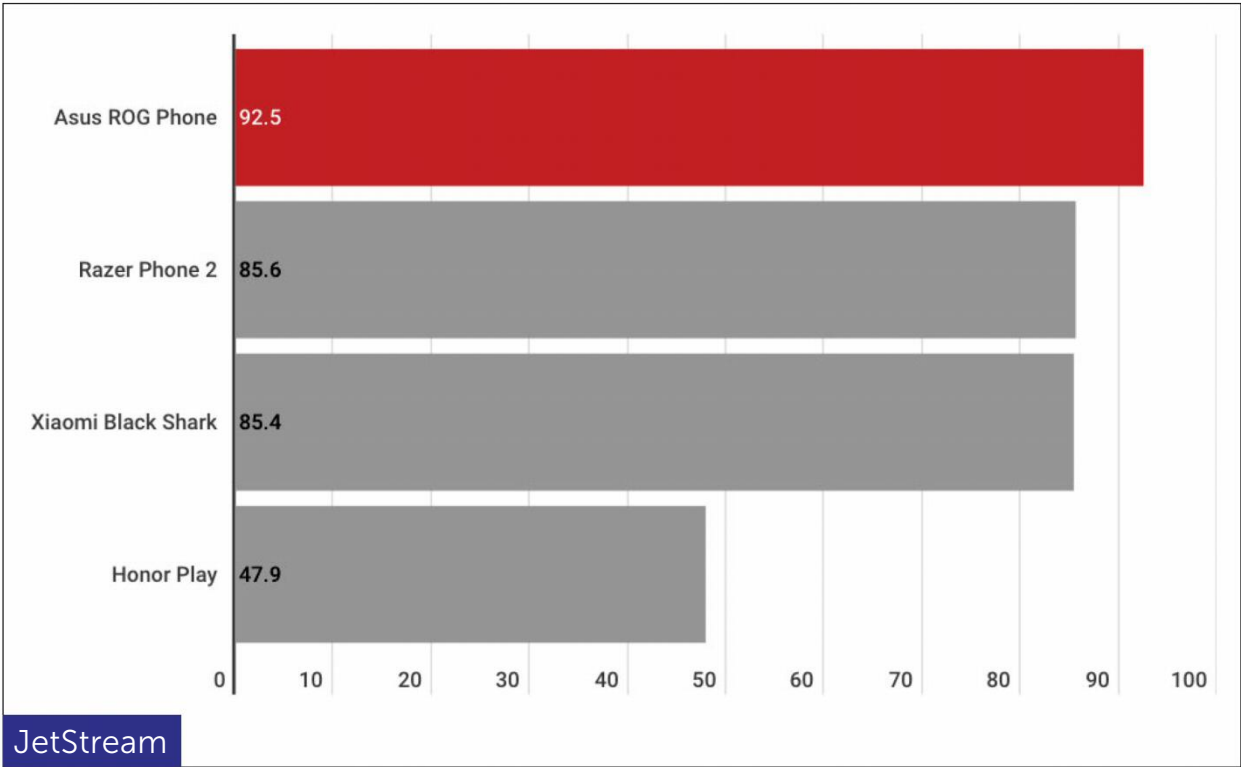
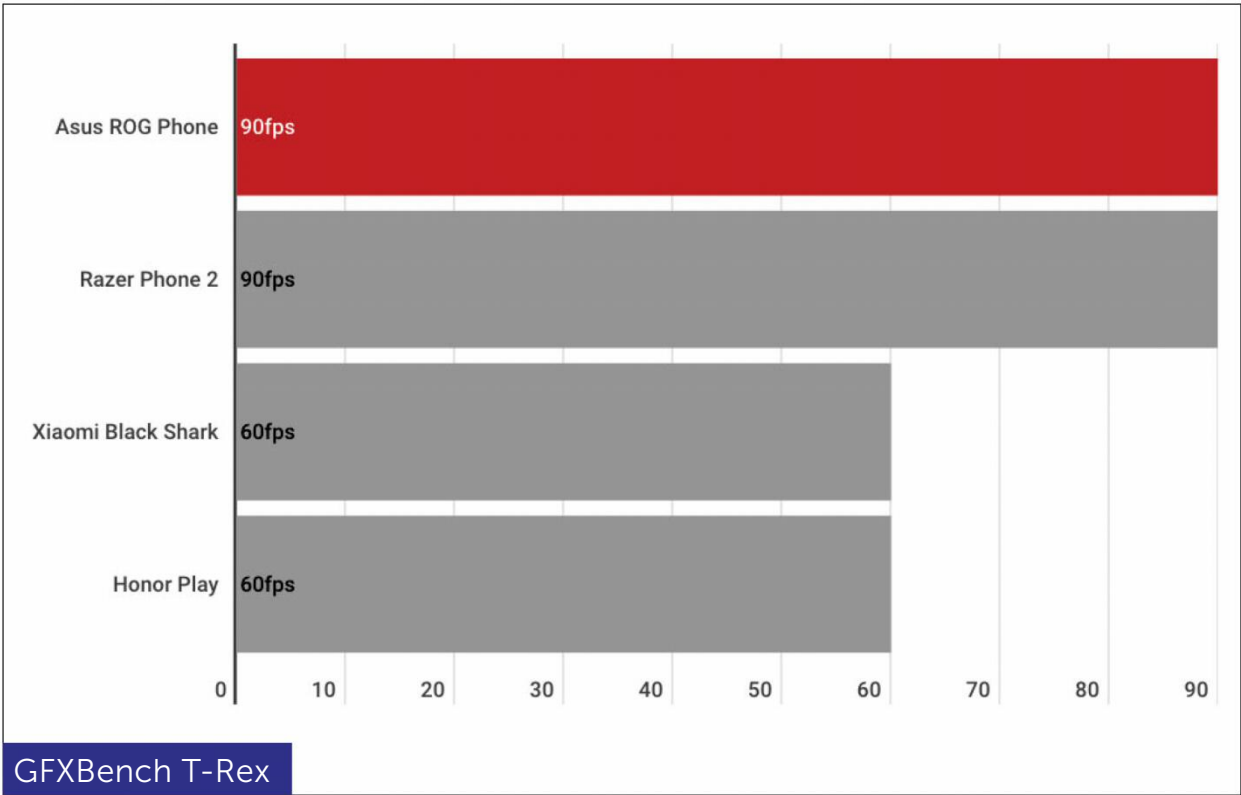
Processor, memory and storage

The ROG Phone continues to impress when it comes to core specifications. They are among the best we've ever seen on a smartphone.

For starters, it has the fastest version of the Qualcomm Snapdragon 845 available. Asus says this has been 'speed-binned' to 2.96GHz – it's normally

BUYING GUIDE





2.8GHz. In the software you can even choose what clock speed you want in certain apps. Add in that there's 8GB of RAM as standard and this is some hefty amount of raw power. Asus claims it comes top in benchmarks such as AnTuTu, Geekbench and 3DMark.

The ROG Phone will also come with at least 128GB of storage, but there will also be a model with a whopping 512GB. Sadly, we can't find the latter for sale in the UK. There's no microSD card slot making this more of a shame.

As you can see in our benchmark results are impressive. However, we didn't see any improvement when using the X Mode which promises better results. We've included the phone's rivals to see how it compares. The graphics results are particularly impressive, thanks partly to the 90Hz display. The Geekbench result, should you care, is not the highest we've seen with various phones, including the iPhone XR and Huawei Mate 20 Pro, beating it.

Cameras

With such a focus on gaming, Asus has barely drawn any attention to the cameras – something that is normally paramount on a modern phone. The ROG Phone does have dual rear cameras, though, at 8- and 12Mp. It appears to be the same setup as the Asus ZenFone 5 with the secondary camera offering a wide 120-degree view. At the front is a standard 8Mp camera.

If there's an area of the phone that lets it down a little, then it's here. While photography is okay, there's nothing to write home about here. Considering the



Macro shot



Landscape shot



Low light shot

price, we'd usually expect a higher quality, but the focus here is gaming, not photography.

Connectivity and audio

The ROG Phone comes with up-to-date specifications, including NFC, GPS, Bluetooth 5.0 with aptX HD and the usual array of sensors you find on almost any phone such as light and proximity. There's also dual-band 11ac/ad Wi-Fi and up to 1.2Gb/s LTE (Cat 18) thanks to the Qualcomm X20 modem.

On the audio side of things is a headphone jack (plus the side one via the detachable cooler mentioned earlier), DTS Headphone:X with 7.1 virtual surround sound and Hi-Res Audio support. The highlight, though, is the front-facing stereo speakers

that come with a 'smart amplifier'. They're easily some of the most powerful we've heard on a phone.

Battery life

Like the Razer Phone, the ROG Phone has a large 4,000mAh lithium-ion battery – when 3,000mAh is about the average for a new smartphone. How long it will last is a big question, especially with the higher speed Snapdragon 845 and high refresh rate on the screen. In our usual test using Geekbench 4, it lasted six hours and 27 minutes. This is a pretty middle of the road result. When gaming in 90Hz and reasonable brightness, you'll lose about 25- to 30 percent for every hour you're playing. This means you'll be charging a lot, so it's a good job Asus has gone for quick charging. It's complicated though, as it depends which USB port you're using.

The traditional port on the bottom supports Qualcomm Quick Charge 3.0. However, the custom side port supports up to Quick Charge 4.0 and Asus's own HyperCharge direct charging, which can power the phone to a whopping 60 percent in just 33 minutes. Even using the bottom port we got an impressive 54 percent in 30 minutes, which is one of the best results we've seen.

Despite having a glass rear cover, the ROG Phone does not support wireless charging.

Software

The ROG Phone runs Android 8.1 Oreo software with Asus' own ROG Gaming UI interface that looks very appropriate for the style of the phone.

The ROG Phone runs Android 8.1 Oreo



The way the interface works is fairly stock Android, but it looks very different to a phone like the Pixel 3. Asus has gone to town with it, which is exactly what we'd expect for a device like this, and it's very specific target audience. Everything from icons to colours is overtly gaming in style. The interface even changes when you switch 'X Mode' on, including lighting up the borders around apps. The wallpaper even changes with a cool animation.

It's these little things that will really appeal to gamers and add value. A bit like the design of the phone itself, you'll probably love or hate it.

The Gamer Centre is the main addition when it comes to apps and if you've used Asus's desktop overclocking suite before you'll feel right at home. It provides plenty of information such as the temperature and clock speed for the CPU, as well as usage for memory and storage. You can also use

the app to control things such as the Air Triggers, AeroActive fan speed and Aura lighting.

Game Genie is your friend if you want to customize things. If you're playing a game, then you swipe in from the right and select the controller icon to load the interface. It provides game capture, live streaming, and more. You can also set profiles for individual apps and games from within the Game Centre such as the maximum CPU speed, screen refresh rate, and more.

Verdict

The Asus ROG Phone is a little difficult to sum up because it's such a Marmite device – it will either be the kind of smartphone you've been waiting forever or pretty repulsive. One thing is for sure, and that is Asus has really gone to town with it and we applaud it for doing so. If you're going to make a gaming phone, then you might as well go hell for leather right? There are plenty of features for hardcore gamers to make use of here, including the AeroActive fan, AirTriggers and all the customization within the software. While it will be many gamer's dream phone, we don't blame you if you prefer the more understated style of the Razer Phone 2. **Chris Martin**

Specifications

- 6in (2,160x1,080, 402ppi) AMOLED capacitive touchscreen
- Android 8.1 (Oreo)
- Qualcomm SDM845 Snapdragon 845 processor
- Octa-core (4x 2.96GHz Kryo 385 Gold, 4x 1.7GHz Kryo 385 Silver) CPU

- Adreno 630 GPU
- 8GB RAM
- 128GB, 512GB storage
- Dual rear-facing cameras: 12Mp, f/1.8, 24mm (wide), 1/2.55in, 1.4µm, 4-axis OIS, dual pixel PDAF; 8Mp, 12mm, no AF
- 8Mp front-facing camera: f/2.0, 24mm (wide)
- Dual-band 802.11ad Wi-Fi
- Bluetooth 5.0
- A-GPS, GLONASS, BDS, GALILEO, QZSS
- NFC
- Fingerprint scanner (rear-mounted)
- USB 3.1, Type-C 1.0
- Non-removable 4,000mAh lithium-ion battery
- 158.8x76.2x8.3mm
- 200g

3. Razer Phone 2

Price: £779 inc VAT from fave.co/2R09MVB

When the first Razer Phone was unveiled it pretty much invented the concept of the gaming phone. People had played games on phones for years, of course, but the idea of designing a phone specifically with gamers in mind was a novelty not seen since the days of the Nokia N-Gage. Since then, imitators have come along, but Razer is ready to meet the challenge with the Razer Phone 2.

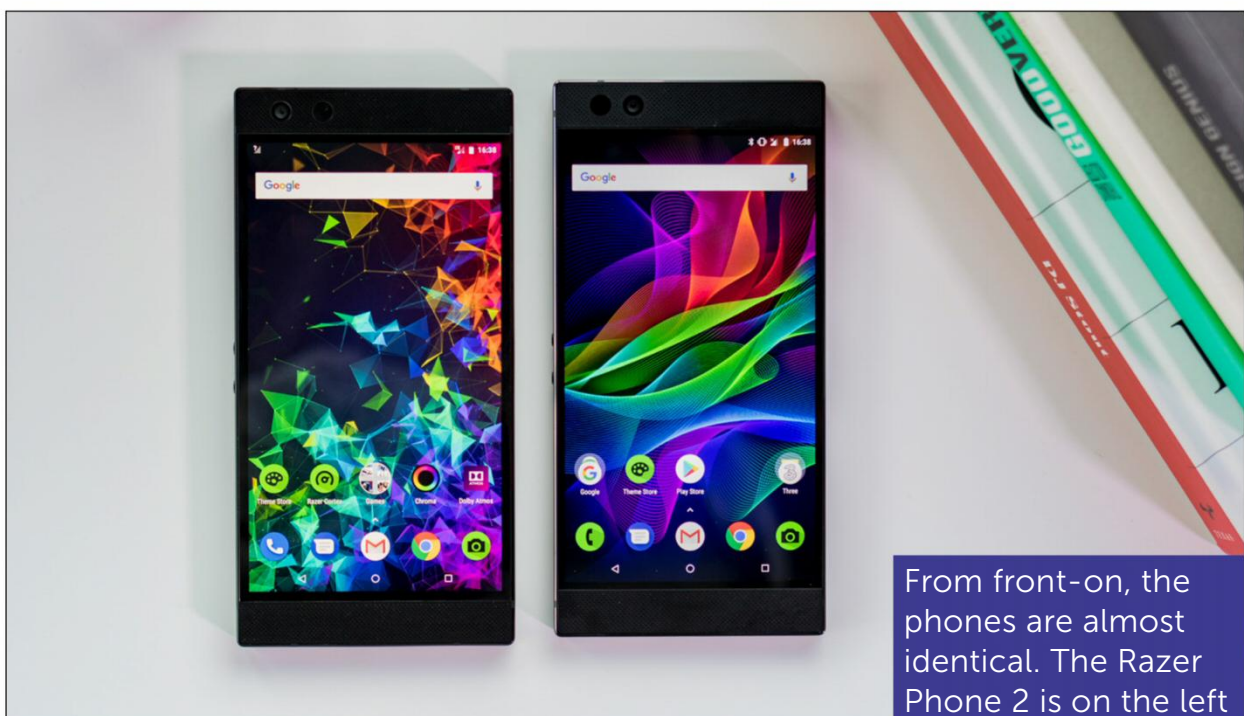
Design

The first thing you're likely to notice about the Razer Phone 2 is that it looks very similar to the original

model (see below). From front-on, the phones are almost identical, and you'll have to really squint to spot the differences: the front-facing camera placement is slightly different, the corners are (ever so) slightly rounder, the body is fractionally thicker. What you can't see is that it's also now IP67 water-resistant – even with those big front-facing speakers.

Other than that, this is much the same as last year: a 5.7in 16:9 display flanked by thick top and bottom bezels sporting large stereo speakers, all in an angular rectangular design. Once again the fingerprint sensor is built into the flat power button midway down one side, with the volume buttons halfway down the other – both optimized for holding the phone landscape while gaming.

It's when you flip the phone over that you see what's really changed. Most obviously, the matte



back has been replaced by glossy black glass (which in turn enables wireless charging). Made out of Gorilla Glass 5, this should be sturdy enough (at least by glass standards), though as with all glass phones it attracts plenty of fingerprints.

The rear camera lenses have also moved – they now protrude slightly more and sit in the centre, above the large Razer logo. More excitingly, the logo itself has changed: it now features Razer's Chroma lighting tech in case you worried that last year's model wasn't glowy enough.

You use the included Chroma app to control the lighting, which can sit on a static colour or cycle through 16.8 million different shades, or flash in various different patterns. You also get a few battery-conserving options – you can keep the light on at all times, only when the screen is on, or just have it flash when you get a notification.

At the end of the day, this is a Razer Phone 1 with a glass back and a flashy logo, so you'll probably know already if that appeals to you or not. Razer's blocky design is definitely less sleek than most flagship rivals, but it has its fans, and it's all in the name of improving the handheld gaming experience.

Display

That's arguably most obvious in the screen. This was arguably the headline feature of the first phone, thanks largely to the industry-leading 120Hz refresh rate. Razer has chosen not to change much this time around: it's the same size (5.7in), the same resolution (2,560x1,440, aka Quad HD), and the same refresh

The Razer Phone 2's screen is mostly unchanged, but since the original boasts arguably the best smartphone display out there, that's no bad thing



rate (120Hz). It's also stuck with the 16:9 aspect ratio, which might seem an odd choice in a market increasingly dominated by 18:9 bezel-less displays, but the company argues the extra screen space is a boon for games, which are still for the most part optimized for 16:9 screens.

What's changed is the brightness. Razer claims the new screen is 50 percent brighter, maxing out at a whopping 645cd/m² – which if true would make this brighter than any phone we've ever tested.

In person, it's hard to spot the difference in quality between the first- and second-generation smartphones. This is clearly a small tweak to a screen that's mostly unchanged – but since the

original boasts arguably the best smartphone display out there, that's no bad thing.

Processor, memory and storage

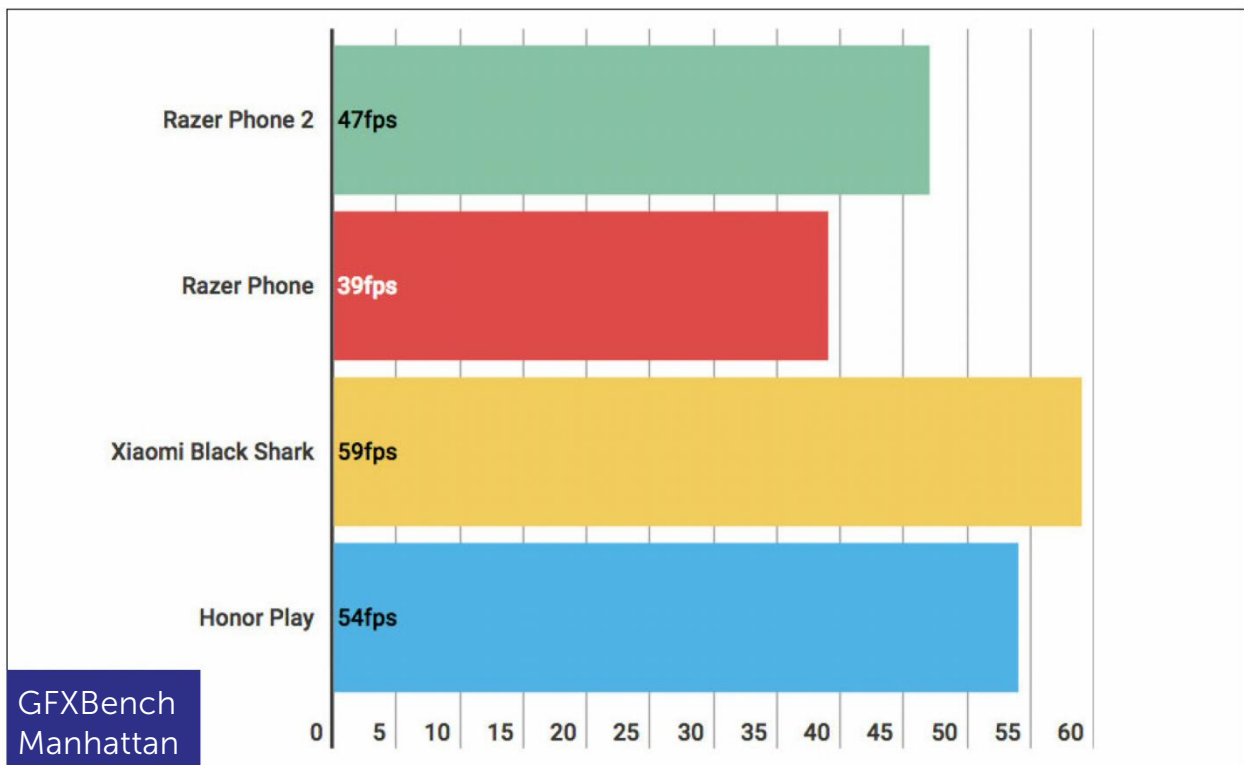
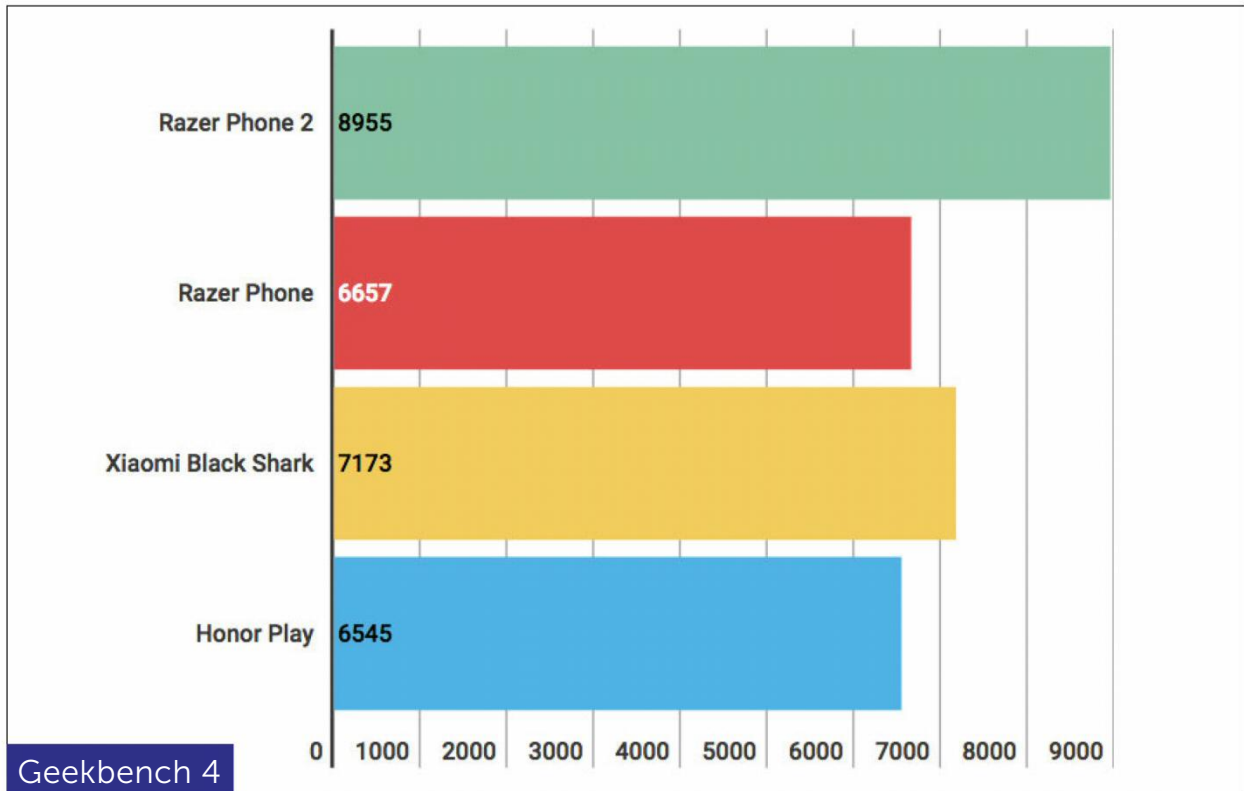
Internal specs haven't had a major shift either. The processor has had the expected upgrade from the Snapdragon 835 to this year's flagship 845 chip to keep pace with other top phones. It also now features Vapor Chamber Cooling – a lot of fancy words to say that it should stay cooler even at peak performance – though we have noticed that the phone does still get noticeably hot in use.

As with the previous model, you get 8GB of RAM and 64GB of storage, together with a microSD card slot – though this will accept cards up to 2TB, giving you plenty of room to expand.

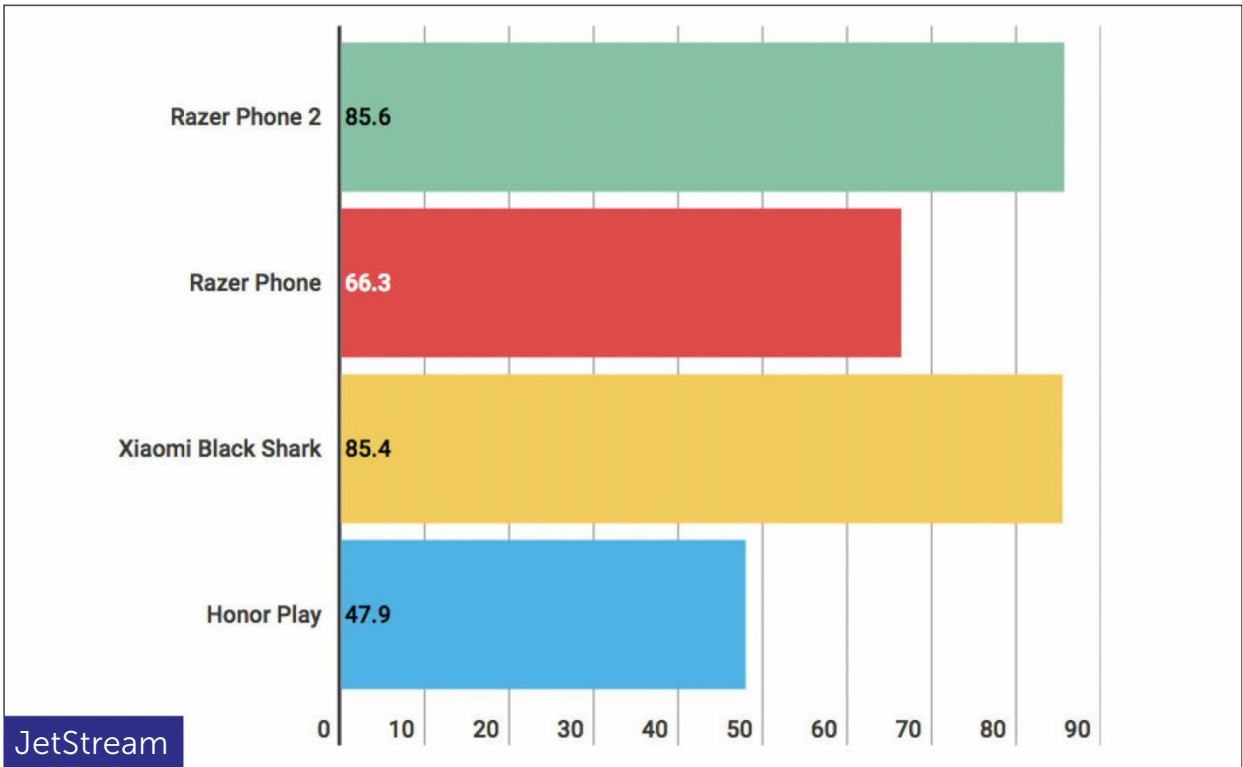
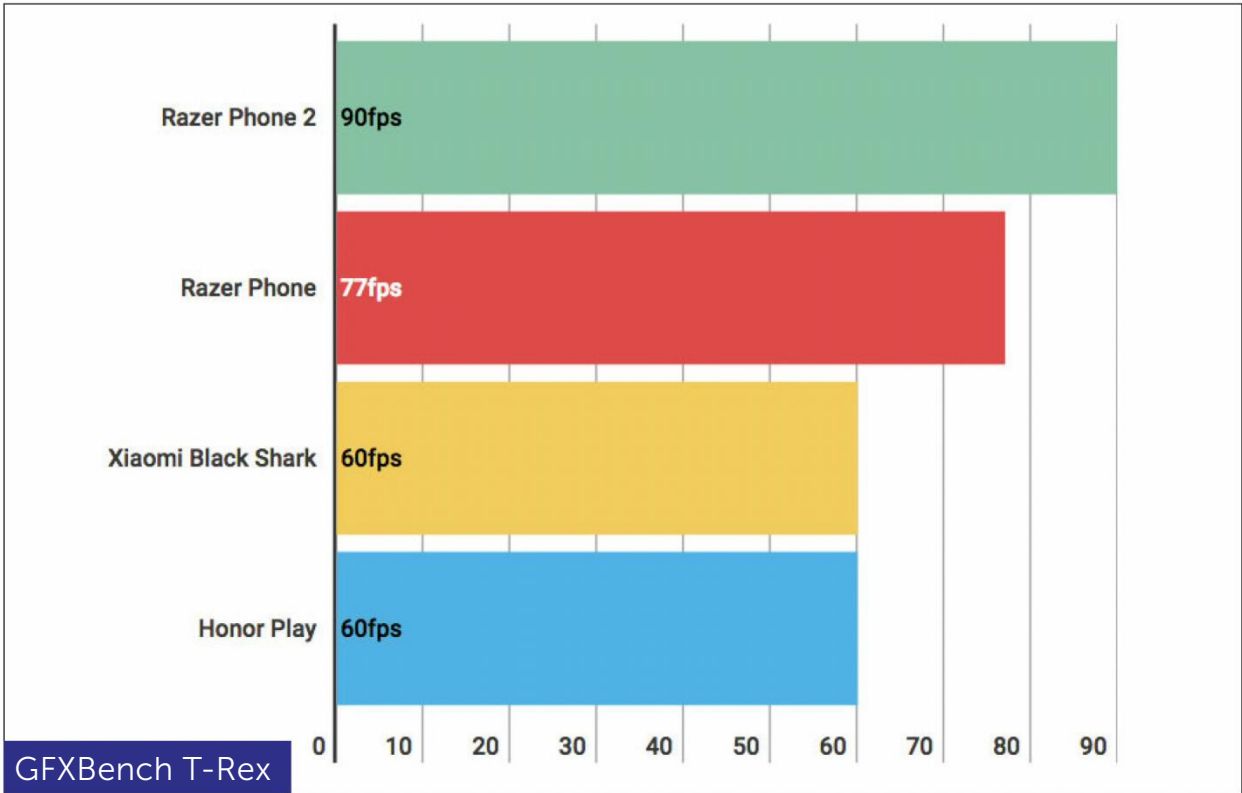
As to be expected, the Razer Phone 2 is rapid both in general use and when gaming, especially with the display clocked up to 120Hz. That's backed up by a Geekbench 4 multi-core score of 8,955, blowing the Xiaomi Black Shark's 7,173 out of the water.

It's not clear-cut though; the Razer Phone 2 boasts impressive GFXBench results in T-Rex at 90fps, but when it came to the high-intensity Car Chase test, Razer's new model managed only 22fps compared to 31fps by Xiaomi's offering.

This can be down to several factors, including the fact that Razer's smartphone offers a much higher resolution and has to power more pixels. In reality, though, it's highly unlikely that you'll notice any lag when gaming on the Razer Phone 2, even with graphically-intense games such as PUBG Mobile.



BUYING GUIDE



Connectivity and audio

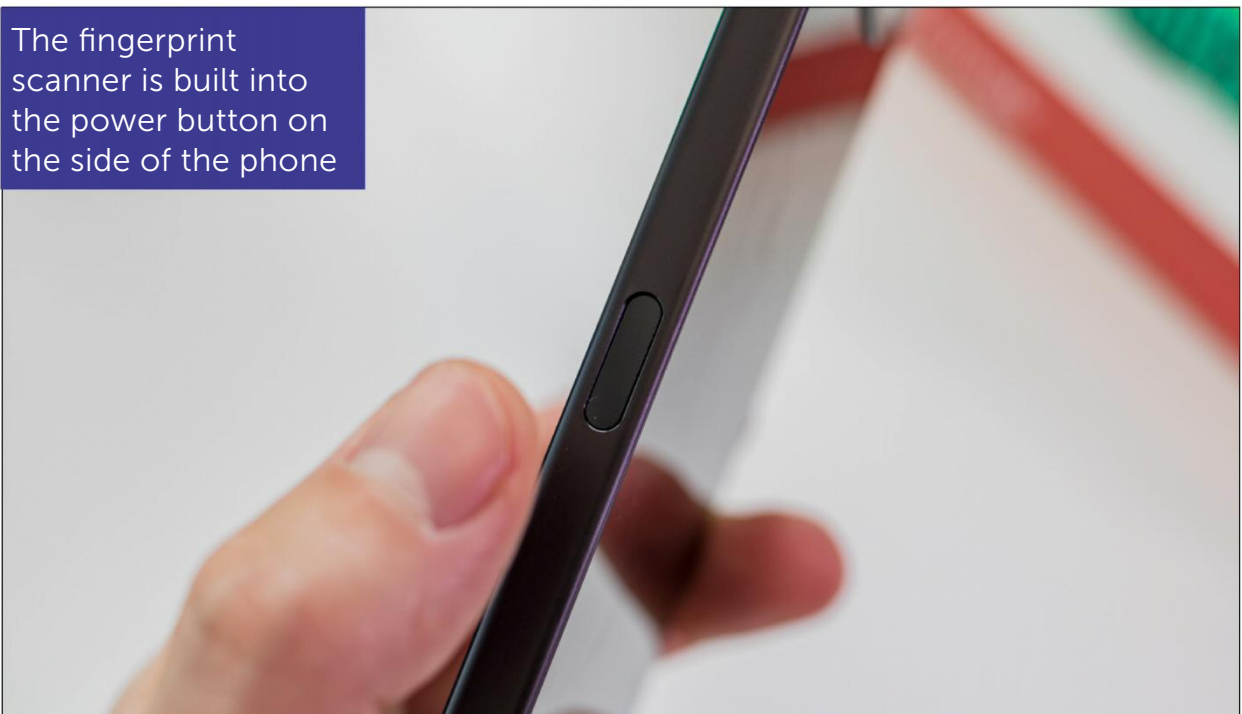
Just like before, the only port here is USB-C, used for charging, audio, and data transfer – though Razer includes a 3.5mm headphone adaptor in the box. As mentioned before, you'll also once again find an impressively fast fingerprint scanner built into the power button on the side of the phone.

In terms of wireless, there's the usual Wi-Fi and Gigabit LTE (now up to 1.2Gb/s), along with Bluetooth 5.0 and NFC.

Finally, those giant speakers flanking the screen have been tweaked too: Razer says they're now louder and clearer. After playing a few games of PUBG and getting that coveted chicken dinner, we can confirm: they are loud and clear.

It really is a superior audio experience, and most importantly, you don't need to worry about your

The fingerprint scanner is built into the power button on the side of the phone



hands covering the speakers during gameplay like with the side-speaker of Xiaomi's Black Shark.

Cameras

There is at least one area of the phone that's had a major revamp: the cameras. Arguably the weakest element of the original handset, Razer has taken the criticism to heart and worked to bring itself into line with its rivals.

First up, the front-facing camera has had a video upgrade to 1080 at 60fps, with an 8Mp f/2.0 lens, which will be welcome news to streamers and vloggers looking to share footage of themselves on the go without compromising on quality.

There's a noticeable jump in quality compared to the original Razer Phone, offering crisp, well-lit selfies and a range of shooting modes – including a Portrait mode – despite offering a single-camera setup.

Meanwhile the rear cameras – now packing new Sony IMX sensors – can capture 4K at 60fps, or shoot 1080p in 120fps slow motion. Both rear lenses are 12Mp, one f/1.75 wide-angle with optical image stabilization, and the other f/2.6 telephoto.

As with the front-facing camera, there is a noticeable jump in quality compared to the original Razer Phone. Colours are more true-to-life, the autofocus is faster and more accurate and images generally look great. The opposite snap of a dog is a great example of the kind of images you can expect from this year's offering.

The improved aperture on the rear lens means that it's better at handling low-light environments.

There is a noticeable jump in quality compared to the original Razer Phone



It doesn't have a dedicated Night mode like other high-end smartphones, and it certainly won't replace the need for a flash, but it does a good job of capturing light and detail.

Zooming in will reveal a slightly aggressive noise cancellation algorithm at play, but that's something that found with most smartphones.

Battery life

Apologies if this is starting to sound familiar, but the battery on the Razer Phone 2 is similar to before, but a bit better. There's the same generous 4,000mAh battery, though software and processor optimizations mean it lasts slightly longer than before. It'll get you through a day comfortably with a mix of social media and gaming, though those that use the smartphone more conservatively could squeeze a day and a half out of a single charge. The introduction of wireless charging is a benefit, enabling you to casually charge the phone throughout the day when not in use.

The big question mark here is the Chroma logo: it's hard to estimate right now just what sort of impact this will have on battery, especially given the range of available settings for colour, brightness, and how often it activates. We'd guess that if you want that logo lit up permanently, you'll pay for it in battery, but there are too many factors to say for sure just yet.

Razer is also selling its own wireless charging dock for the new phone (£99 from fave.co/2UZZFiL), which can prop it up in landscape, portrait, or flat. This even comes with its own Chroma lighting effects: cycling colours when the phone is charging,



Razer also sells its own wireless charging dock for the new phone

static green when the battery is full, and a sort of angry flashing red when it detects that the phone isn't positioned correctly for charging.

That's all well and good, but remember two big caveats here: it's expensive at £99, and the lighting will only ever be a nuisance if you tend to charge your phone overnight by your bed.

Software

The Razer Phone 2 ships with Android 8.1, though the more recent Android 9 will reportedly roll out to owners before too long.

Once again Razer is running a version of the OS that's pretty much stock, the main tweak being the use of the Nova Launcher – a version of the home screen and app drawer that's highly customizable, so you can tweak things to suit your tastes.

The Razer Theme Store also makes a return for more decorative options, and is joined by a mobile version of Razer Cortex, the company's combined performance optimizer and app storefront. The big sell here is that it includes game recommendations generated by the Razer team, providing a much easier way to find great new Android games than Google's own Play Store.

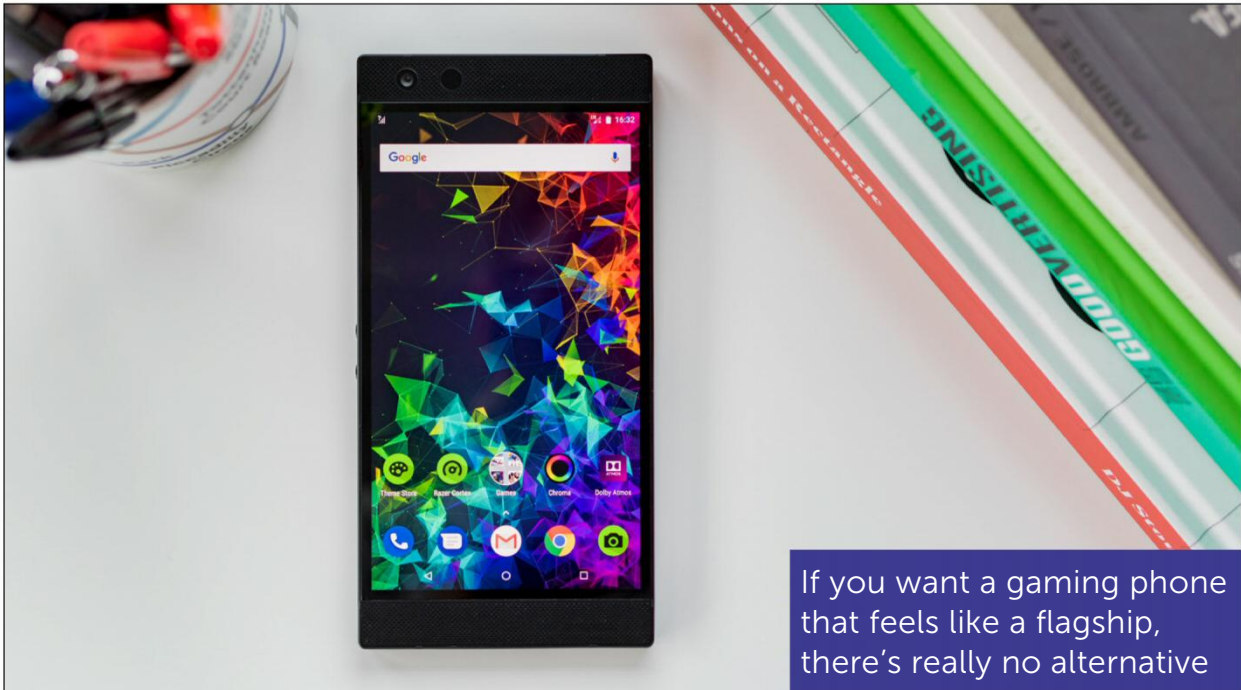
Verdict

The Razer Phone 2 is far from a reinvention, and if you weren't a fan of the original this is unlikely to convince you otherwise. Instead, Razer has doubled down on its idiosyncratic design choices and backed it up with flagship features, including waterproofing and wireless charging, along with a few novelty LEDs.

If you want a gaming phone that feels like a flagship and don't mind paying for it, there's still really no alternative. But if you're looking for pure performance, you can get that for less by skipping a few of the bells and whistles packed in here. **Dominic Preston**

Specifications

- 5.72in (2,560x1,440) IPS LCD capacitive touchscreen
- Android 8.1 (Oreo)
- Qualcomm SDM845 Snapdragon 845 processor
- Octa-core (4x 2.8GHz Kryo 385 Gold, 4x 1.7GHz Kryo 385 Silver) CPU
- Adreno 630 GPU
- 8GB RAM
- 64GB storage
- Dual rear-facing cameras: 12Mp, f/1.8, 25mm (wide),



- 1/2.55in, 1.4 μ m, dual pixel PDAF, OIS; 12Mp, f/2.6,
- 1/3.1in, 1 μ m, 2x optical zoom
- 8Mp front-facing camera: f/2.0
- Dual-band 802.11ac Wi-Fi
- Bluetooth 5.0
- A-GPS
- Fingerprint scanner (side-mounted)
- USB Type-C 1.0
- Non-removable 4,000mAh lithium-polymer battery
- 158.5x79x8.5mm
- 220g

4. **OnePlus 7 Pro**

Price: £699 from fave.co/2liqzgf

The near-meteoric rise of OnePlus has in large part been thanks to a pretty clear strategy: offer the most

important features of the year's biggest flagships, minus the flashy fluff, at a fraction of the price. With the OnePlus 7 Pro, that all changes.

The 7 and 7 Pro phones marked the first time that OnePlus released two handsets at once: the 7 is the natural next step from last year's 6T, while the 7 Pro is a step up from that and is a full-blooded flagship. It's clear OnePlus is throwing down the gauntlet and trying to prove once and for all that it can make phones to rival the likes of the Samsung Galaxy S10 or Huawei P30 Pro if it wants to. And on the strength of the 7 Pro, the company clearly can.

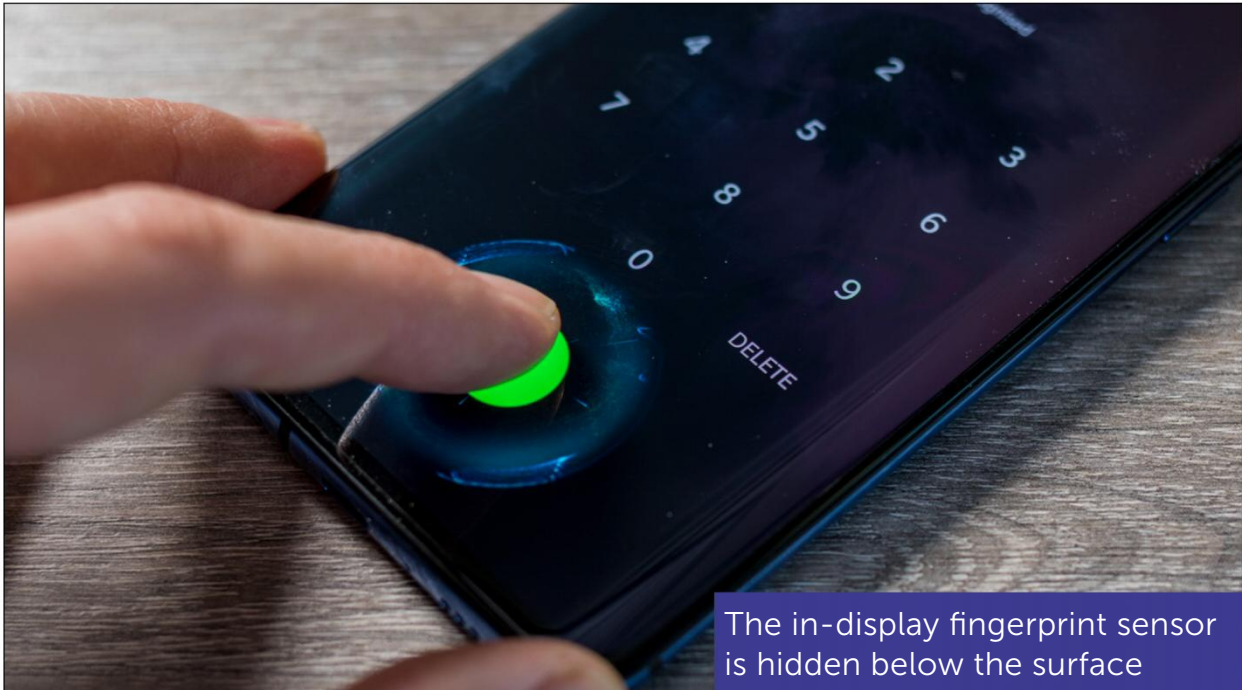
I've been using the 7 Pro for over a week, and I have been seriously impressed. The core OnePlus ethos is still present, but backed up by better specs focused on two of the areas of the phone people really use the most: the camera and the screen.

Display

Easily the first thing you'll notice about the 7 Pro is the display, which excels in just about every way it is possible for a smartphone screen to excel.

Size? A whopping 6.67in. Refresh rate? A smooth 90Hz. Resolution? QHD+, or 3,120x1,440 to be precise. I could go on: colour range, pixel density, curved edges, HDR, Gorilla Glass 5 – on paper this is one of the best panels you'll find in a smartphone today, and it's entirely uninterrupted by a notch.

The 90Hz refresh rate is perhaps the most welcome new feature. Mostly limited to gaming phones such as the Razer Phone 2 or Asus's ROG Phone before now, higher refresh rates smooth out



animations across the board, leaving every interaction with the phone feeling faster and more fluid.

It's a change that's hard to put your finger on at first, but flick between the 60- and 90Hz options and you'll quickly realize that just about everything you do with the phone feels smoother – not to mention the benefits it brings when playing games or watching content that can make the most of the refresh rate.

There's a battery drain, of course, so if you prefer you can drop down to 60Hz – and smartly, even while on this mode the phone will still jump up to 90Hz when you're, say, playing a game that can make the most of it before dropping back down to 60Hz for your day-to-day stuff.

There's once again an in-display fingerprint sensor hidden below the surface, though it's improved from the 6T. OnePlus says it should be almost twice as fast



thanks to an upgraded lens and larger sensor area, and it definitely feels it. It still fails to spot my thumb a few times too often, but it feels like this is almost as good as a dedicated physical scanner, which is the highest praise it could hope to get.

Throw in the giant resolution, curved edges (with palm rejection to avoid accidental presses) and support for HDR10+ across both YouTube and Netflix and it's clear that this screen is something special indeed.

Those curved edges help the phone feel slim – though at 8.8mm it's not the absolute thinnest device around – while the Gorilla Glass 5 protection extends to the rear as well. This comes in one of three finishes: Mirror Gray, Nebula Blue (pictured above), and Almond. The blue in particular is stunning, with a slightly matte effect to the gradient design,

while Almond is a creamier take on Apple's Gold iPhones. Of course, I can't talk about the display or the design without addressing the notch – or rather, the lack thereof. The 7 Pro is one of the latest proper full-screen phones to hit the stores, in this case by shifting the selfie camera into a small slider that pops up when needed, and retracts just as quickly.

Fall detection means it withdraws if you accidentally drop the phone, and naturally OnePlus assures us it's tested the mechanism hundreds of thousands of times for durability's sake. It works for face unlock too, and is astonishingly quick there – the camera retracts almost as soon as it's opened, so it is still a split-second process.

Cameras

The selfie shooter isn't the only exciting camera here, though. Beyond the novel design, that one isn't all that exciting otherwise: it's a similar 16Mp camera to the one found in the 6T, just in a new spot.

More interesting are the cameras you'll find when you flip the phone over (after briefly pausing to admire that blue gradient for the umpteenth time, of course). For the first time OnePlus is offering a triple camera setup, and one that could rival the best around.

Let's take it one lens at a time. The main camera is 48Mp, f/1.6 with optical image stabilization (OIS). It's powered by the same Sony IMX586 sensor you'll find in a few other similar smartphones, but the actual lens is an entirely custom design.

Sitting above the main camera is a 16Mp ultra-wide lens, with an f/2.2 aperture and a 117-degree field



of view. There's a very slight fishbowl effect, which actually looks worse than it is thanks to the curved screen, but otherwise this does a good job.

Finally, and more excitingly, the bottom camera is an 8Mp telephoto, with OIS and up to 3x optical zoom – while you can go up to 10x hybrid optical and digital zoom. This isn't quite into the 5x optical zoom territory of the Huawei P30 Pro (in fact this whole rear camera setup is almost identical to the regular P30), but it is capable of some sharp zoomed in shots.

The software underlying all that hardware has had an update too, and the newly dubbed UltraShot algorithm is clearly an attempt to catch up with the competition – it's fair to say OnePlus has never been renowned for its photography prowess.

Despite additional computational work – the camera makes greater use of multiple shots to extract more information and enrich images – photos process more quickly. This is especially the case in a revamped take on Nightscape, OnePlus's take on a flash-free low light mode. This is now in the same league as the P30 Pro and Pixel 3 for low light photos, with astonishing sharpness and colour drawn out of even the darkest environments.

In general, photos are crisp and I've been impressed by the dynamic range the camera is capable of, while colours tend to be fairly accurate. That can mean photos look slightly muted if you're used to the heavily saturated shots taken by Huawei and Samsung's latest, but will deliver if you prefer something that looks more true to life. The optical zoom is comparable to the results in the P30, and actually yields a little more

BUYING GUIDE



Selfie shot



Macro shot



Night Mode
low light shot



Low light shot

detail than some shots from that phone – though at the cost of slightly more noise.

As for video, the rear cameras can shoot up to 4K at 60fps, while the selfie lens will do 1080p at 30fps, and you also get the option of super slow motion from the rear cameras – either 1080p at 240fps, or 720p at 480fps.

Processor, memory and storage

It's probably clear by now that OnePlus is really leading on the display and camera when it comes to the 7 Pro – two areas where the company has never previously made a name for itself, no doubt not by chance.

Still, it hasn't exactly skimped elsewhere. The processor is the flagship Snapdragon 855, and it's backed up by some meaty memory options, with up to 256GB storage and 12GB of RAM available – though there's no support for microSD cards, so what you get is what you get.

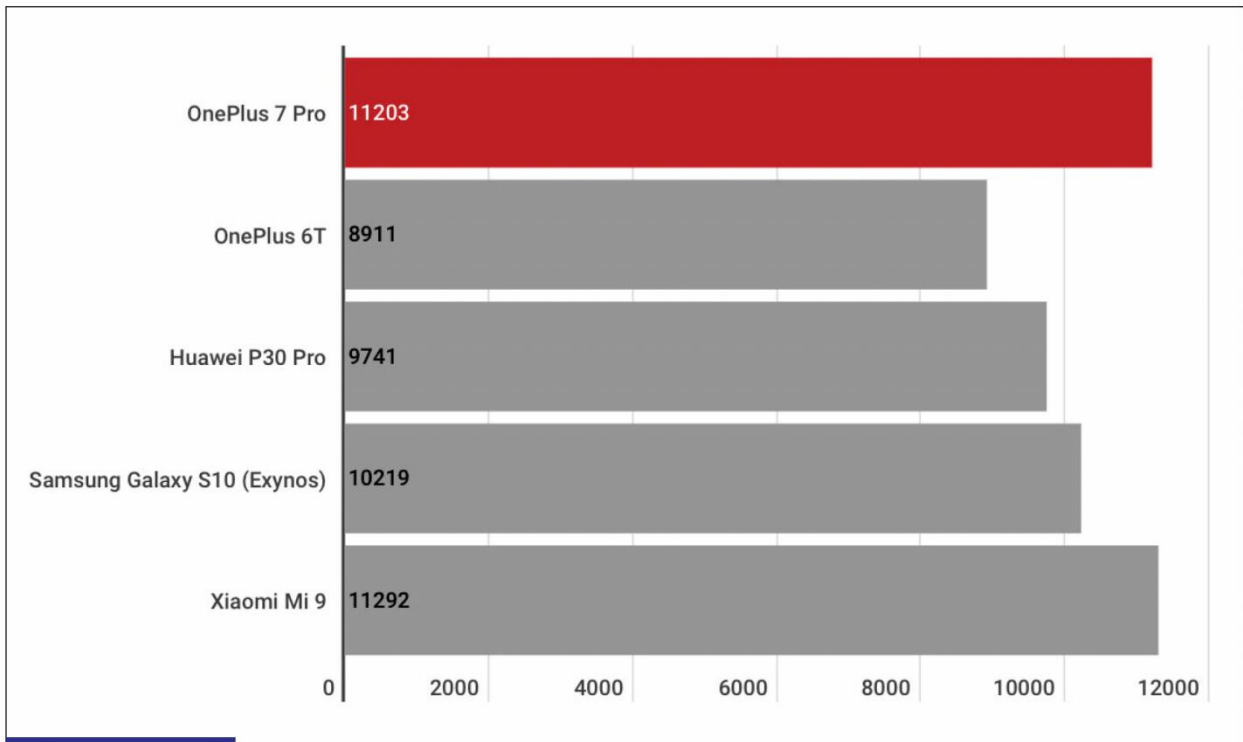
That storage is special, too: the 7 Pro uses UFS 3.0 – universal flash storage – which is a fancy way of saying that it should be able to save and access files much quicker. That means faster app opening, game loading, and file transferring – it's the equivalent to plugging an SSD into your computer. It's also the only phone on sale right now to boast the tech, though technically not the first – the Galaxy Fold uses UFS 3.0 too, but we all know how well that launch went. It's not clear yet how much of a difference the new drive is making in and of itself, but it's contributing to silky smooth performance across the board.

I've been testing the 12GB RAM, 256GB storage model, and unsurprisingly all that power has seen it sail through most of our benchmarks, with results up there with flagship rivals – though not blowing them away, and surprisingly it drops below the 6T on some of the graphical tests, where the extra RAM doesn't really contribute. This is on pre-release software though, which can complicate things, and I'd expect software updates to refine the hardware performance.

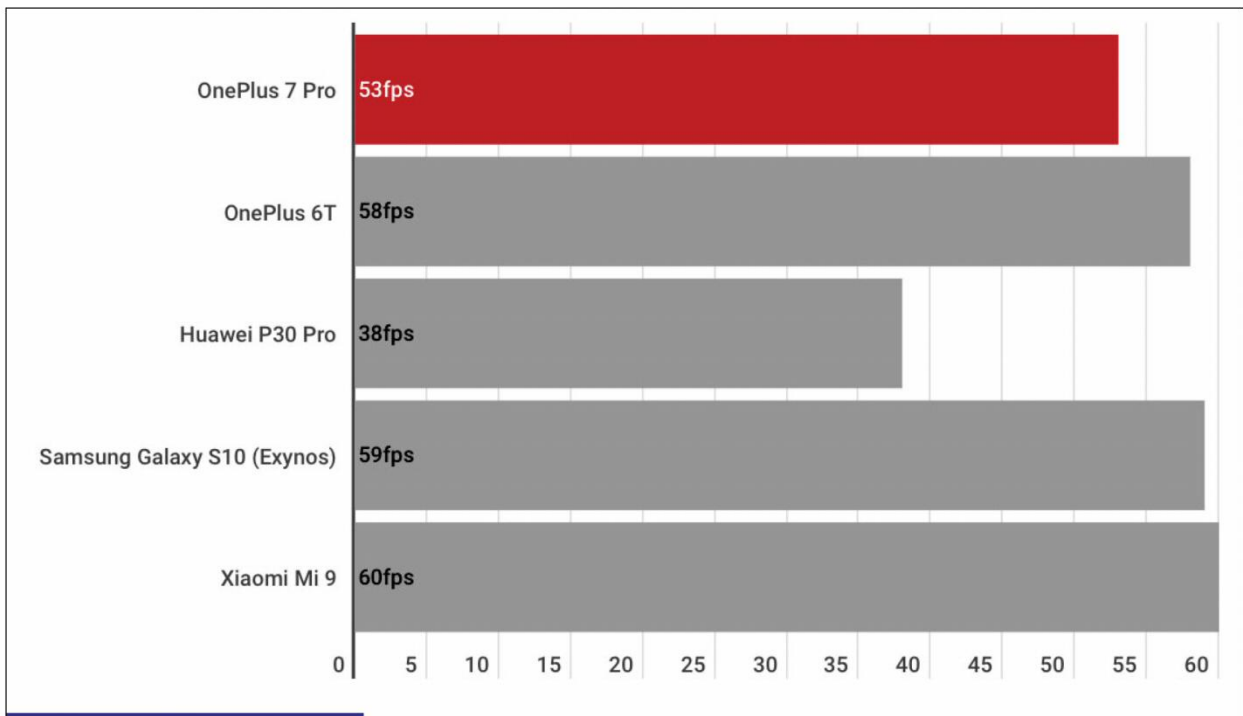
Either way, this thing is fast, and it's at the point where it's so fast that minor variations in individual benchmarks don't reflect anything to worry about unless you're absolutely obsessed about maxing out your frame rate in Fortnite.

The 4,000mAh battery just about stretched out to 48 hours of usage, so if you charge every day you shouldn't ever have to worry about running out – again, this is pretty much in line with similarly priced rivals. The inclusion of 30W Warp Charging also means it'll top up fast – it managed to get 64 percent of its battery back in just half an hour when charging from empty.

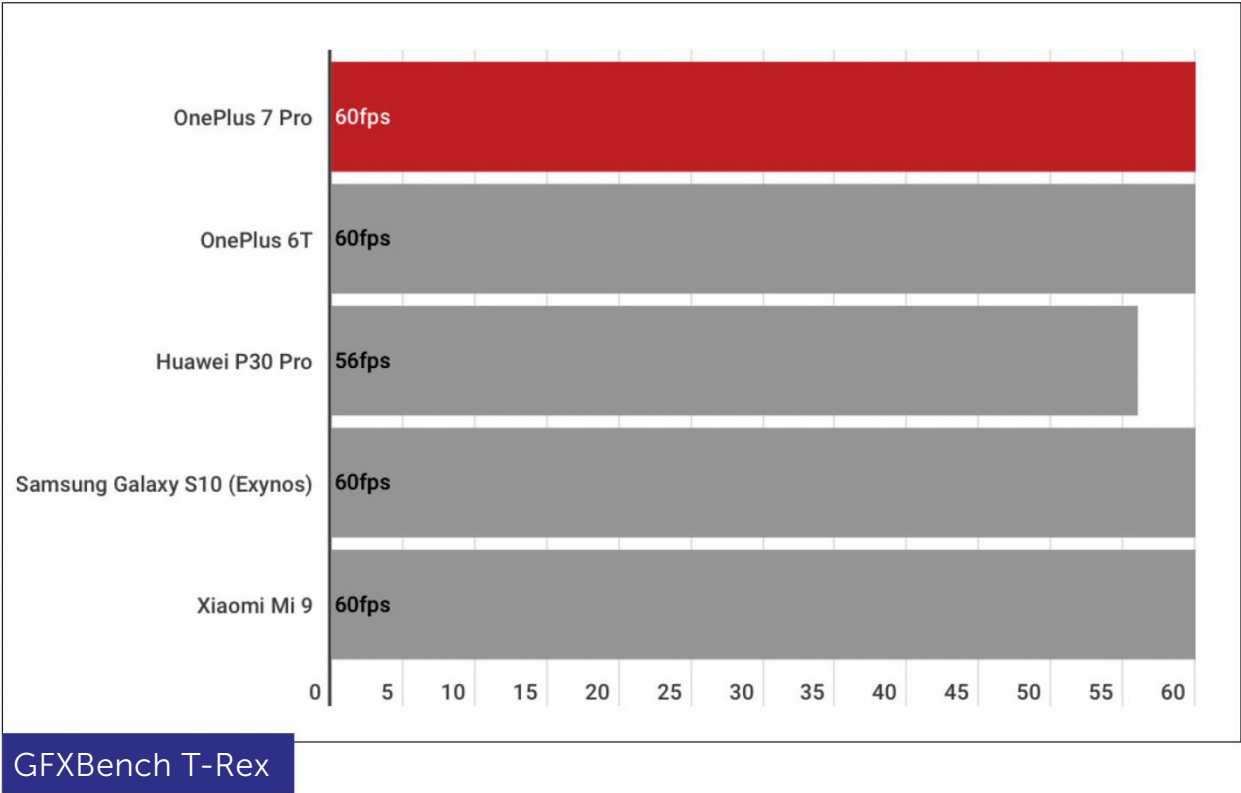
That charging is USB-C (still no support for wireless here, OnePlus says it just isn't good enough yet), with a USB 3.1 port. There's NFC, Bluetooth 5.0 (with aptX HD support), and stereo speakers with Dolby Atmos – they sound good for a phone, but y'know. There's even a new haptic motor – something previous OnePlus phones have struggled with. These still aren't the best vibrations out there, but how many people really worry about that?



Geekbench 4



GFXBench Manhattan



Finally, waterproofing. OnePlus says getting an official IP rating is a waste of money that drives prices up, so there’s no official measure of how water-resistant the phone is. The company itself says the phone can survive a splash (there’s even an extra layer of liquid protection around the sliding selfie cam), but doesn’t recommend you take it swimming.

Ultimately, an IP rating offers peace of mind that the 7 Pro just won’t offer in that regard, but as OnePlus is quick to point out, no smartphone manufacturer covers liquid damage in its warranty – even those with industry-leading IP68 ratings. So basically this *should* keep working if you drop it in the bath, but I’m not about to risk the phone and this review to find out.

Software

Let's wrap it all up on a high note. As ever, OnePlus excels on the software side – Oxygen OS is probably our favourite Android skin, and the only one that's arguably better than Google's own efforts on the Pixel phones.

The look is close to stock, but with usability tweaks across the board and subtle UI tweaks to smooth over some of Android's rough edges. Not everything is perfect – swiping up for back remains one of the less intuitive gesture controls out there, and the lack of a true always-on display is still a frustration, but for the most part this is about as good as Android gets. Tweaks this year are mostly minor, but welcome. There's a built-in screen recorder in case you want to share footage direct from your phone, which lets you record for as long as you want, pausing and resuming at any point, and record either internal or external sound.

The full-screen means no room for a notification LED, so instead OnePlus has turned to a software solution: the sides of the display will pulse with light when a notification comes through, with the colour actually determined by the app in question. It's a nice touch, but still easy to miss, as the light only pulses once – it won't keep flashing after the fact, as a normal LED might. That could get annoying of course, not to mention drain the battery, which is likely why OnePlus opted to avoid it.

Gaming mode has had an upgrade to give more granular notification controls, and there's even an enhanced version – branded by the e-sports team



Fnatic – that not only blocks any and all notifications but also reroutes almost all of the phone’s processing power and network signal towards your game.

If that all sounds a bit intense, Zen Mode is its chilled out counterpart. This also shuts down every notification, but goes even further: it basically locks you out of the phone entirely, leaving you able only to receive calls, phone emergency services, or use the camera. This lasts for 20 minutes – no more, no less – and once activated it’s impossible to turn off. Yup, even if you turn the phone off and on again – this is the nuclear solution to terminal procrastination.

Verdict

I went looking for reasons not to give the OnePlus 7 Pro full marks, but I’ve struggled to find much to fault. The display, camera, and core specs are essentially

all best-in-class – or close enough to count – while the few shortcuts (wireless charging, an IP rating) are easily explained away by a price point that still undercuts the closest comparable rivals by some way.

Yes, this costs a bit more than you're probably used to from OnePlus, but it delivers on enough of its promises to justify that price hike – and if you're not convinced, the regular OnePlus 7 is always, at the same old price OnePlus has been hitting for the last year or two.

In a year that's already seen both Samsung and Huawei drop pretty phenomenal flagships, OnePlus has still managed to drop a device that is one of the phones to beat in 2019. **Dominic Preston**

Specifications

- 6.67in (3,120x1,440; 516ppi) Fluid AMOLED capacitive touchscreen
- Android 9.0 (Pie); OxygenOS 9
- Qualcomm SDM855 Snapdragon 855 (7nm) processor
- Octa-core (1x 2.84GHz Kryo 485, 3x 2.42GHz Kryo 485, 4x 1.8GHz Kryo 485) CPU
- Adreno 640 GPU
- 6GB, 8GB, 12GB RAM
- 128GB, 256GB storage
- Three rear-facing cameras: 48Mp, f/1.6, (wide), 1/2in, 0.8µm, Laser/PDAF, OIS; 16Mp, f/2.2, 13mm (ultrawide); 8Mp, f/2.4, 78mm (telephoto), 3x zoom, Laser/PDAF, OIS
- Front-facing camera: Motorized pop-up 16Mp, f/2.0, 25mm (wide), 1/3.0in, 1.0µm

- Dual-band 802.11ac Wi-Fi
- Bluetooth 5.0, A2DP, LE, aptX HD
- A-GPS, GLONASS, BDS, GALILEO, SBAS
- NFC
- Fingerprint scanner (under display)
- USB 3.1 Type-C 1.0 reversible connector
- Non-removable 4,000mAh lithium-polymer battery
- 162.6x75.9x8.8mm
- 206g

5. **Xiaomi Black Shark**

Price: £579 from fave.co/2MbADul

Razer took the smartphone market by storm in 2017, releasing a handset aimed at gamers featuring impressive specs and a 120Hz display. It's a trend we've seen continue, with the Xiaomi Black Shark.

This is the second cheapest phone here, but offers unique features that make it worth considering, including a bespoke game controller that offers universal Android game support.

Design

While many smartphones in the market look broadly similar, the Xiaomi Black Shark's gaming-inspired design makes it stand out from the crowd, and it's clear who this is aimed at.

The rear of the smartphone isn't a single sheet of aluminium or glass, oh no; it's layered and textured, mimicking the look of high-end gaming laptops. That's enhanced by (admittedly Razer-esque) lime-green accents found across the rear and along the bezels at



the front of the display, adding a much-needed splash of colour to an otherwise single-colour smartphone.

And, in true gaming laptop fashion, the Black Shark logo on the rear lights up whenever the phone is being charged, and whenever the dedicated game mode is activated.

The game mode, dubbed Shark Mode after the smartphone, is activated by a physical switch located on the side. We'll go into the specifics of this below, but we think that the inclusion of a physical switch rather than a dedicated gaming app is a great move. While apps can disappear into obscurity, having an easy-access switch at hand means it's more likely to be used by gamers. It has certainly been the case with us, anyway.

Gaming laptops are generally bigger and bulkier than their non-gaming counterparts, and it's the same with the Black Shark. It's bulky, measuring 161.6x75.4x9.3mm and weighing 190g, even when compared to other gaming-focused smartphones like the 8mm-thick Razer Phone. It doesn't feel particularly big in the hand though, thanks to the use of curved edges that fit nicely in the palm of your hands.

Though it's not a bezel-less display like what's on offer from the likes of the iPhone XS, the Black Shark does have thin bezels on the side that help it stay slim while sporting a large display. There is a forehead and chin above and below the display, but this is common for gaming-focused smartphones.

The black-and-lime combination certainly looks good, but you can also pick the Black Shark up in Grey or Royal Blue, though the latter is exclusive to the 128GB model.



What separates the Xiaomi from other gaming-focused smartphones is the inclusion of a bespoke controller that turns it into a Switch-esque device. This snaps onto the top of the smartphone and connects via Bluetooth, offering two configurable trigger buttons along with an analogue stick for movement when playing mobile games.

Though it doesn't provide a pair of controllers to attach to either end of the smartphone, using only one can still make a huge difference to mobile gameplay, especially with PvP games such as PUBG Mobile and Fortnite. You can map the triggers to look down sights and fire, and these can be remapped on a per-game basis. It's charged via USB-C, like the Black Shark itself, and offers impressive battery life.

Admittedly, the layout isn't perfect (we'd like something slightly bigger), but even in its current state it makes a huge difference when playing mobile games, offering something closer to console-level gameplay than mobile.

Display

Let's start off with the display; the Xiaomi Black Shark has a 5.99in IPS LCD display with an 18:9 aspect ratio that helps increase the size of the screen without having too much of an effect on the overall width of the smartphone. It's high-res too, featuring an FHD+ (2,160x1,080) resolution and a pixel density of 403ppi, helping the phone offer crisp, vibrant visuals when playing the latest mobile games.

The main difference between the display on offer from the Black Shark and that on offer by the Razer

Phone is the refresh rate; while the Black Shark is capped at 60Hz, the Razer Phone can offer double that, at 120Hz. This means the display can provide a maximum of 120fps in games, and provides a smoother, clearer experience both when playing games and using the phone in general. It's not a deal-breaker, but if you're a hardcore gamer looking for a gaming laptop-esque experience on mobile, the lack of an enhanced refresh rate may disappoint.

Processor, memory and storage

Beneath the surface, the Xiaomi Black Shark has an octa-core Qualcomm Snapdragon 845 processor, comprised of 4x 2.8GHz Kryo 385 Gold cores, along with 4x 1.8GHz Kryo 385 Silver cores. That's coupled with the high-end Adreno 630 GPU which is more powerful than the Adreno 540 featured in the Razer Phone, though the amount of RAM depends on the storage option you go for.

You've got the choice of 6GB, which comes with 64GB of storage, or 8GB of RAM with 128GB of storage. The decision is more important than with other Android phones as, surprisingly, the Black Shark doesn't feature a microSD card slot to expand storage, so you're stuck with what you buy.

We've reviewed and benchmarked the 6GB/64GB variant, so be sure to take this into consideration when taking a look at our benchmark results opposite.

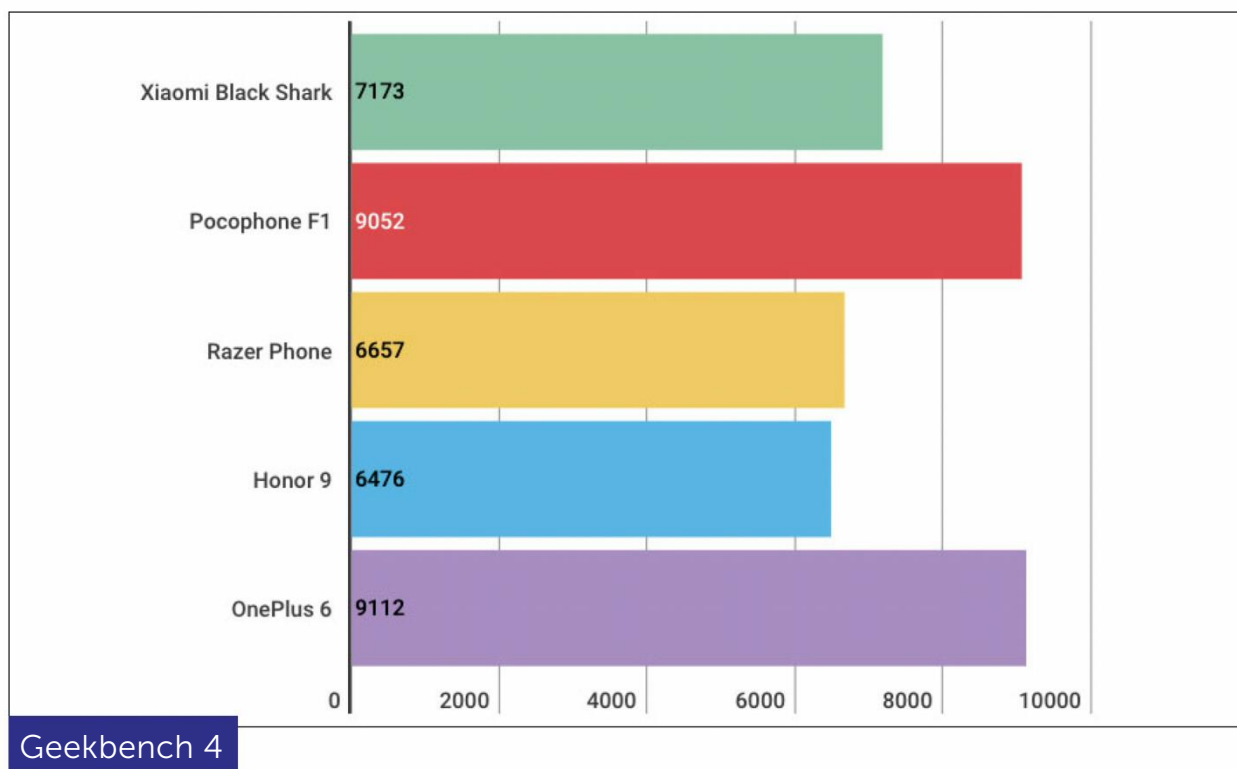
What does this mean, in terms of real-life use? Essentially, the performance is snappy and the Black Shark can easily handle the latest games like PUBG Mobile and Fortnite running on the highest graphics

settings with no hint of lag. That high-level of performance isn't unique to games either; it's system-wide, with everything from taking snaps on the camera to browsing on Google Chrome being almost-instant.

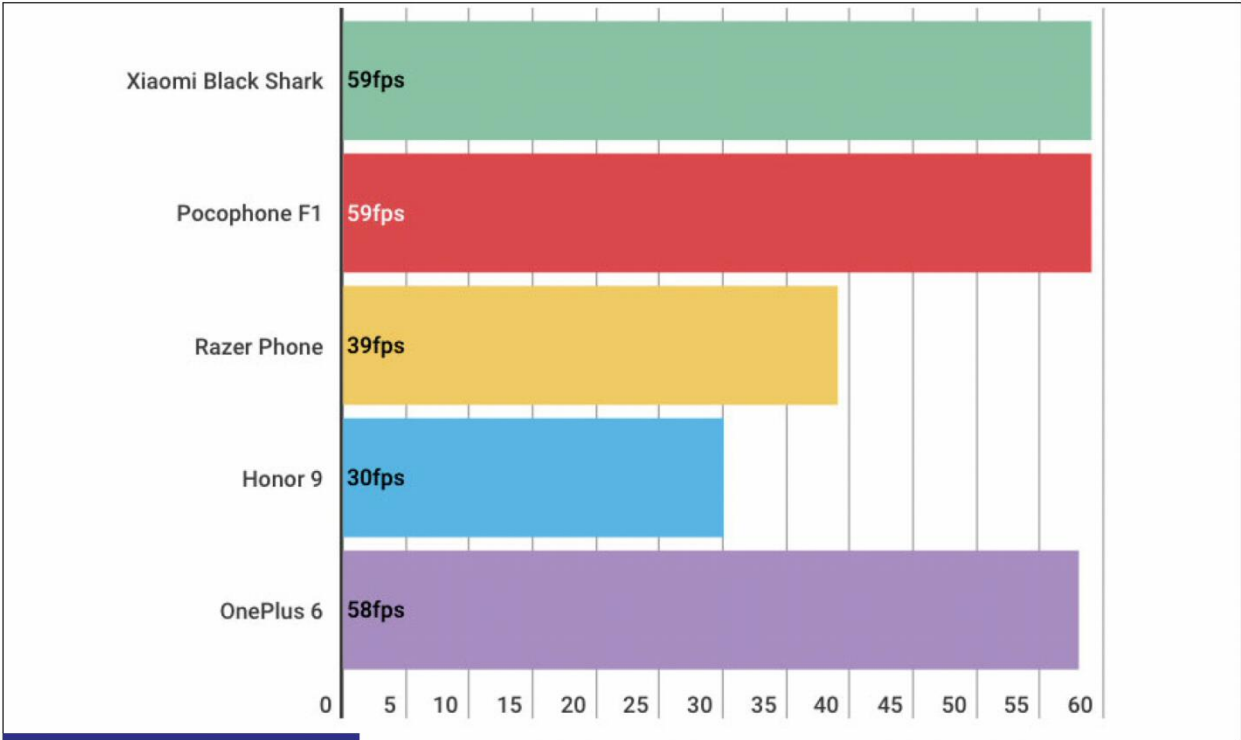
The Black Shark sports a dedicated 'Shark Mode' that offers a console-esque experience, allowing you to browse through your collection of Android games via a custom interface, along with blocking any incoming calls and notifications and freeing up RAM.

We thought that clearing the RAM may improve performance, but it didn't seem to be the case – according to our benchmark results anyway. We ran GFXBench tests both in standard and Shark mode, and got identical results from each.

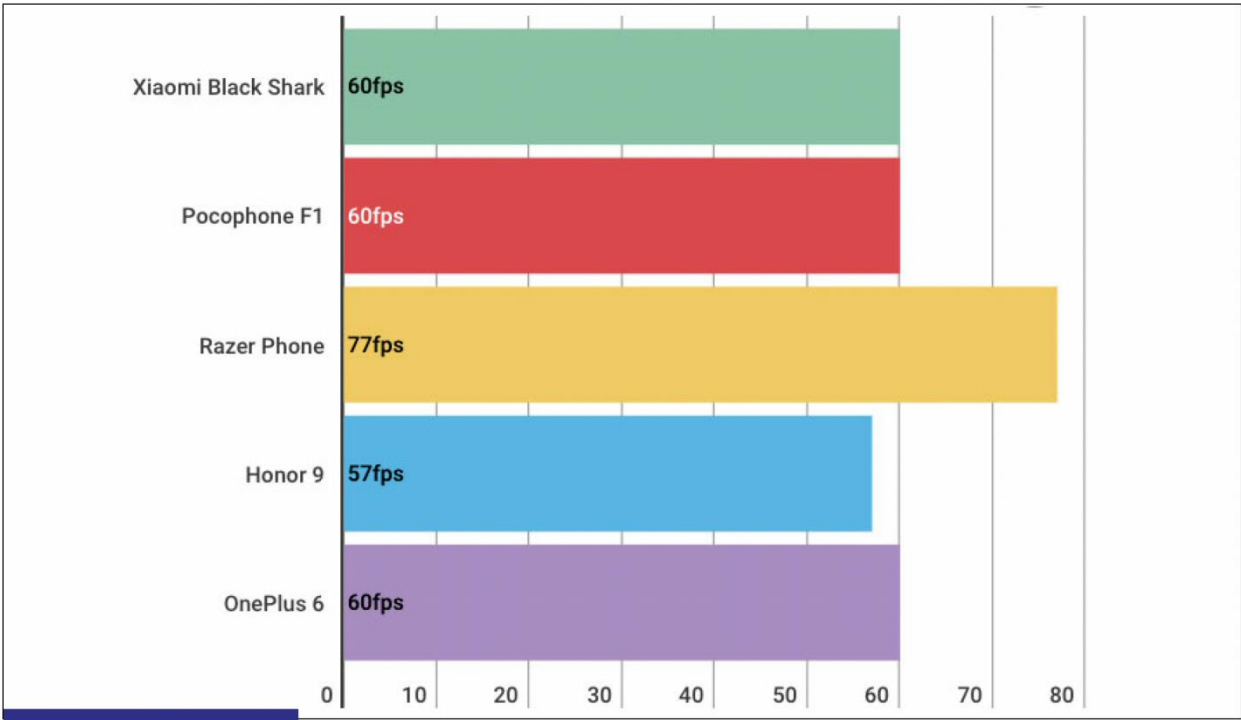
We've included full benchmark results below, along with comparisons to other smartphones. The headline



BUYING GUIDE



GFXBench Manhattan



GFXBench T-Rex

WHAT IS AVAXHOME?

AVAXHOME-

the biggest Internet portal,
providing you various content:
brand new books, trending movies,
fresh magazines, hot games,
recent software, latest music releases.

Unlimited satisfaction one low price

Cheap constant access to piping hot media

Protect your downloadings from Big brother

Safer, than torrent-trackers

18 years of seamless operation and our users' satisfaction

All languages

Brand new content

One site



AVXLIVE ICU

AvaxHome - Your End Place

We have everything for all of your needs. Just open <https://avxlive.icu>

results are that the Xiaomi scored 7,173 in Geekbench 4, and managed to get up to 31fps on GFXBench Car Chase, the high-level GPU benchmark. Though not quite enough to fight off some high-end smartphones, the discounted price compared to the Galaxy Note 9 and iPhone XS balances it out. It's certainly good enough for mobile gaming, that's for sure!

Connectivity and biometrics

The Black Shark is the latest in a long line of high-end smartphones to ditch the headphone jack, though much like Apple, the manufacturer includes a USB-C-to-3.5mm adaptor in the box. It's not the perfect solution as using an adaptor means that you won't be able to charge and use wired headphones at the same time, but with more and more people investing in wireless headphones, we can't imagine this will be an issue for much longer.

You'll also find a fingerprint scanner embedded in the Home button, which works as well as to be expected. It can easily recognize fingerprints from awkward angles, and is lightning-fast at unlocking.

The Black Shark also offers Dual-SIM support; a feature that has been popular in Chinese markets for years, and is slowly making its way to the Western market in 2019. Like most smartphones, it's dual stand-by rather than dual-active, but is still a desirable option for those that travel abroad, or those that use multiple smartphones in everyday life.

And, of course, the Black Shark features the latest in connectivity options, including Bluetooth 5.0, Wi-Fi 802.11 a/b/g/n/ac, GPS and a USB-C port for charging.

Cameras

Despite the focus on gaming, the Black Shark has a decent camera setup that is capable of snapping impressive photos, though we do feel that it isn't as strong on the video front. Let us explain.

On the rear of the smartphone is a dual-camera setup, comprised of 12- and 20Mp sensors. Both sensors feature f1.8 aperture, and you'll find a dual-tone flash embedded ready to illuminate dark environments.

The use of a dual-camera setup allows for some advanced functionality; alongside the Portrait mode that adds a bokeh effect to blur the background of the photo, the 20Mp sensor offers 2x optical zoom, much like the iPhone XS. We were especially impressed with the edge detection in the Portrait mode, which tends to have hit-and-miss results depending on the manufacturer.

But while the images look vibrant and detailed on the surface, zooming in to 100 percent reveals over-aggressive noise cancellation at play. The details on the bricks of St. Pancras in the opposite image are soft when zoomed in, making it near-on impossible to make out individual bricks or paving slabs on the pavement. It's not a huge issue – it's something that most smartphones fall victim to – but it's certainly worth highlighting.

It's rare to see a front-facing camera that can compete with the rear camera, but that's what we've found with the 20Mp front-facing snapper of the Black Shark. The pictures taken are generally in line with those captured by the rear-facing camera,



and despite featuring a single sensor, the Portrait mode is available and nails the edge recognition. It's more than enough for selfie-taking, Skyping and Snapchatting, and even features a handy Straighten tool to keep your selfies straight.

In terms of video, the Black Shark can record video in 4K, 1080p and 720p, though the latter two options are capped to 30fps. According to Xiaomi, you can record up to 120fps at 720p, but we couldn't find the option to enable it after exploring the Camera app. The performance wasn't amazing either; the phone struggles to adjust between different levels of brightness, often leaving highlights blown out if stepping into direct sunlight from shade. There's no OIS or even EIS on offer either, resulting in shaky videos.

It's a similar story with the front-facing camera. It can record at 1080p at 30fps, but the quality can vary greatly depending on the levels of light and how shaky your hand is when recording.

In essence, it's handy for capturing little videos to share on social media, but those looking for pro-looking video capture should look elsewhere.

Battery life

With a focus on gaming, this phone offers a whopping 4,000mAh battery to keep you going through those intense mobile gaming sessions. We've found that, in reality, the battery life is impressive and is more than enough to last a day with average usage. Even when gaming, we were surprised at how slowly the battery was depleting, though this will vary somewhat

Battery life is impressive and is more than enough to last a day with average usage



on the game that you're playing, the brightness of the display and more.

When the battery does eventually get low, the Black Shark offers quick charging capabilities, allowing you to quickly charge the smartphone and get back into the action. The only catch is, like with most fast chargers, it's only compatible with the provided charger. The issue is that the smartphone doesn't come with a UK-compatible plug, so you'll have to pick up an adaptor to make the most of the quick charging capabilities.

Software

The phone runs Android 8.1 Oreo, and while it's not stock Android, it's as close as it could get. It runs Xiaomi's JoyUI, but it's not heavy on custom elements like other Android skins. We even put it side-by-side

with an Android One device and could barely tell the difference.

There aren't any pre-installed apps beyond the Google suite of apps, all of which can be removed if not useful. It's worth pointing out that despite the similarities, it isn't actually Android One-supported, so it won't get the monthly security updates from Google like supported devices will.

The most interesting feature of the Black Shark's software is Shark Mode, Xiaomi's console-esque dedicated game mode activated by flipping the physical switch on the side of the smartphone. It will display every installed Android game in one simple-to-access location, while also blocking any incoming calls and notifications for interruption-free gameplay. It also clears the RAM on the smartphone for enhanced performance, though as mentioned



above, we didn't really notice any difference in terms of performance from our benchmarks.

The best part of Shark Mode is that it allows you to customize the controller support on a per-app basis. You can access the controller settings at any point in-game, and using an on-screen overlay, you can adjust the function of each button. This means that you're able to use the controller on games that don't officially support controllers, including Fortnite and PUBG Mobile, helping to give you the edge in online gameplay.

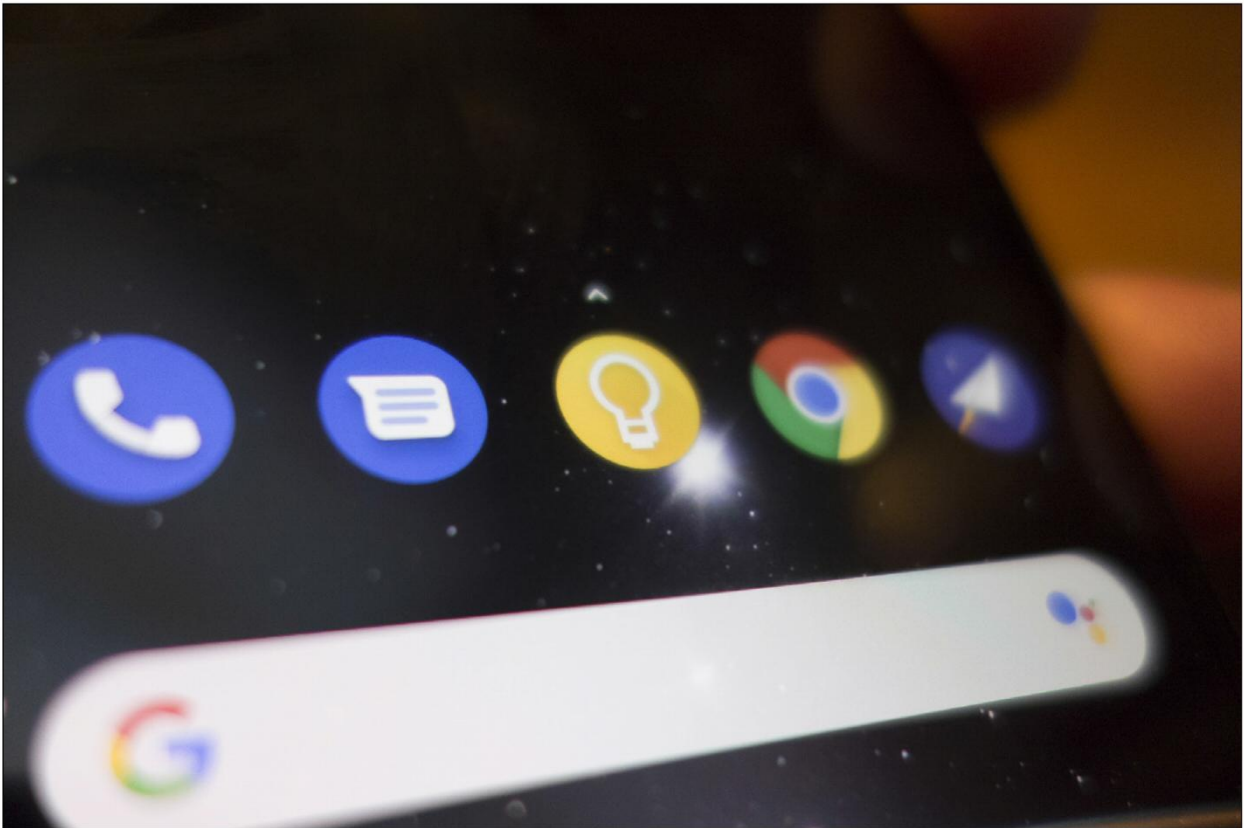
Verdict

While the Xiaomi Black Shark doesn't feature an enhanced refresh rate like the Razer Phone 2 or Asus ROG Phone, the inclusion of a bespoke controller that works with all Android games should be enough to entice hardcore mobile gamers. It offers great performance, long battery life and it stands out from the crowd in terms of its' gaming laptop-esque design. It's also one of the cheapest gaming phones here, so if you're on the market for a gaming phone that doesn't cost £600, this is for you. **Lewis Painter**

Specifications

- 5.99in (2,160x1,080, 403ppi) IPS LCD capacitive touchscreen
- Android 8.1 (Oreo)
- Qualcomm SDM845 Snapdragon 845 (10nm) processor
- Octa-core (4x 2.8GHz Kryo 385 Gold, 4x 1.8GHz Kryo 385 Silver) CPU

- Adreno 630 GPU
- 6GB, 8GB RAM
- 64GB, 128GB storage
- Dual rear-facing cameras: 12Mp, f/1.8, 1.25µm, dual pixel PDAF; 20Mp, f/1.8, 1.0µm, AF, 2x optical zoom
- Front-facing camera: 20Mp, f/2.2, 1.0µm
- Dual-band 802.11ac Wi-Fi
- Bluetooth 5.0
- A-GPS, GLONASS, BDS
- Fingerprint scanner (front-mounted)
- USB 2.0, Type-C 1.0
- Non-removable 4,000mAh lithium-ion battery
- 161.6x75.4x9.3mm
- 190g



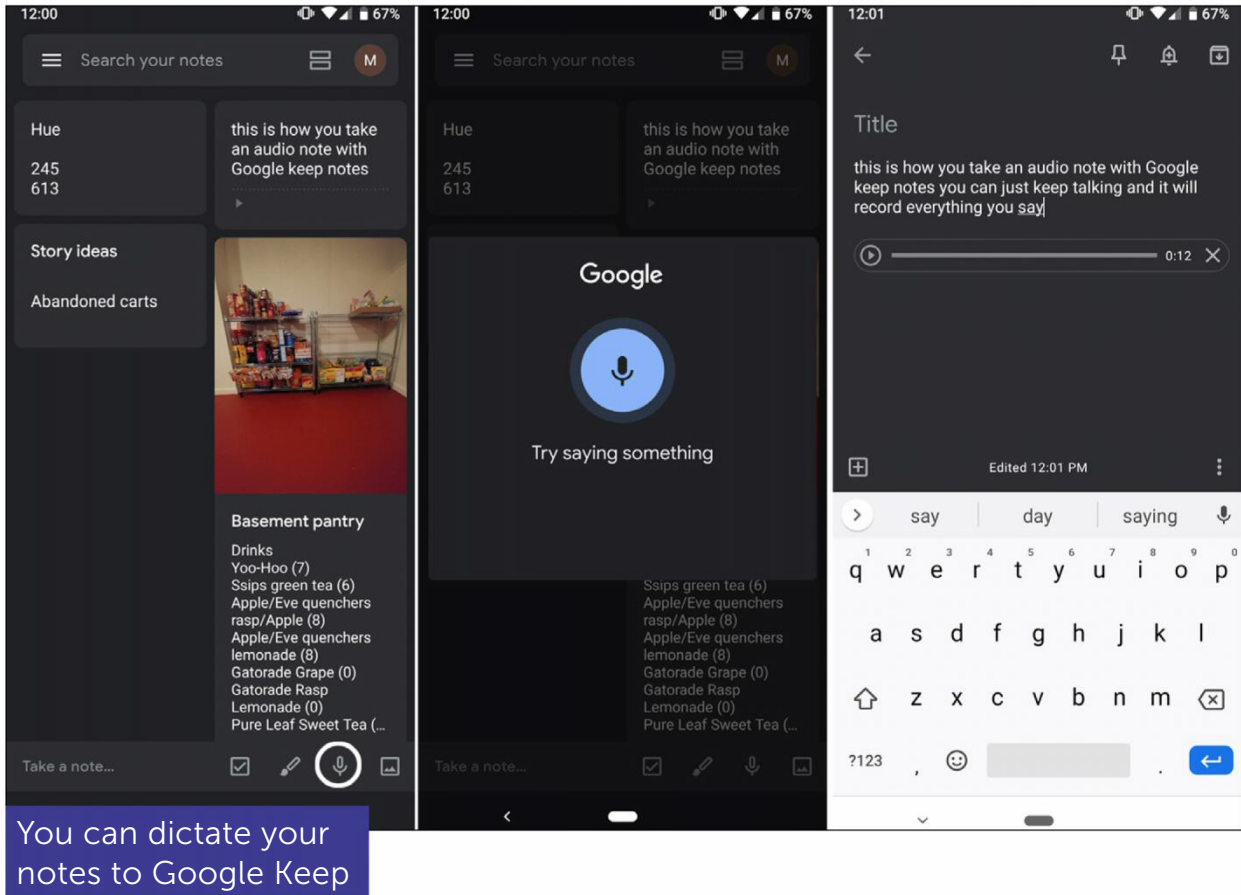
Google Keep Notes tips

10 tricks to help you become a master. **MICHAEL SIMON** reports

Google Keep Notes might be the most underrated of Google's services. It's more than just a place to jot down your thoughts – it's also the missing link to bring Docs, Calendar, Photos, and the rest of Google's services together. Here are 10 tips and tricks to unlock its full potential.

1. Take a voice memo

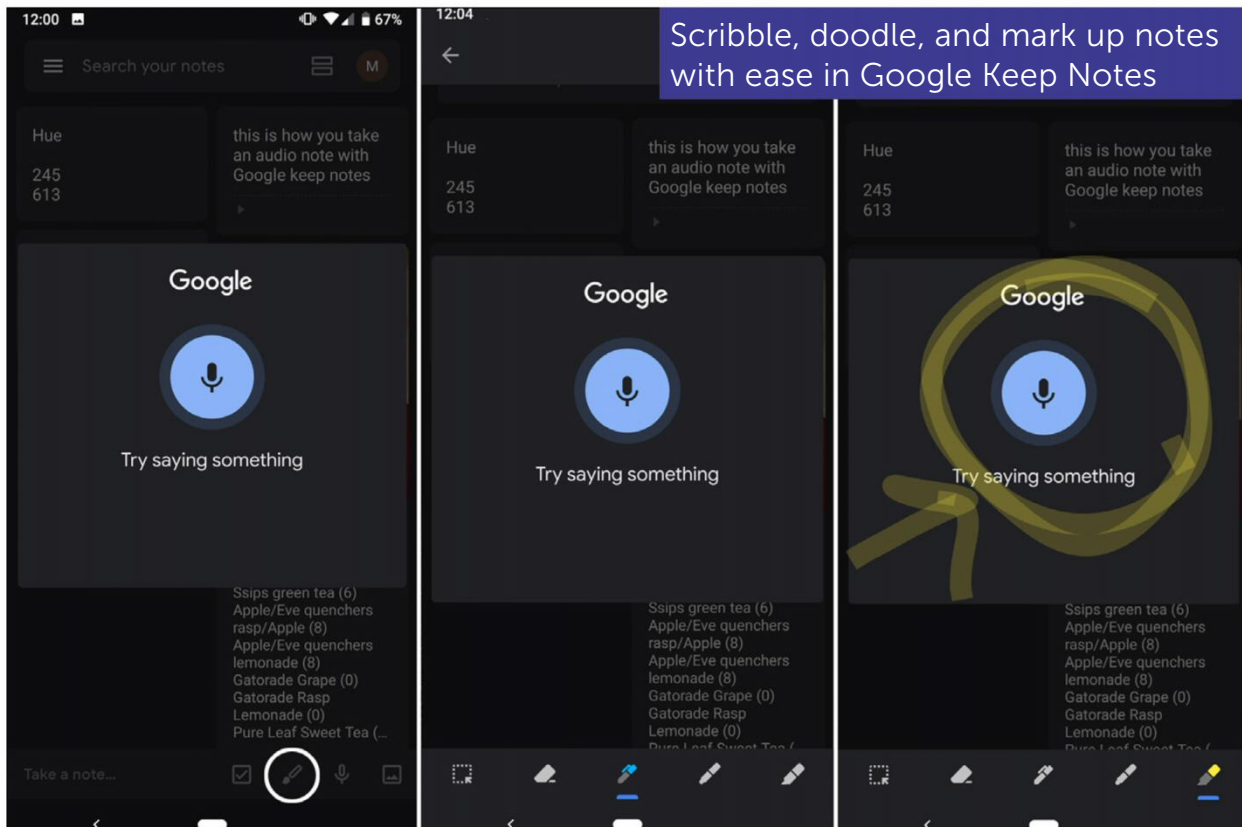
While most people use Google Keep Notes to type quick notes to themselves, you can actually get your



thoughts down far faster by using your voice. In the bottom menu on the main screen, you can tap the microphone icon to speak your note to Google Keep. It'll both record and transcribe everything you say, so even if Google's dictation engine misses a word, you'll still have a record of it.

2. Transcribe text from a photo

Audio isn't the only thing Google Keep Notes can transcribe. If you import a photo with words on it, Keep Notes can grab that text. Tap the photo to open it, and then tap the three-dot menu in the top-right corner and select Grab image text. Go back to your



note and you'll see the words that were in the pic pasted below it, in the proper order, capitalized appropriately, and ready to edit.

3. Draw on (or off) your photos

Transcribing text isn't the only thing you can do to a photo in Google Keep Notes. You can also highlight, colour, and draw on them to your heart's content. Just import or snap a picture and select the paintbrush icon to be taken to the markup screen. There you can select your pen style and annotate the image without affecting the original file. And if you just want to doodle on a note, you can do that too, by choosing the paintbrush icon in the main menu.

4. Sync with Google Docs on your PC

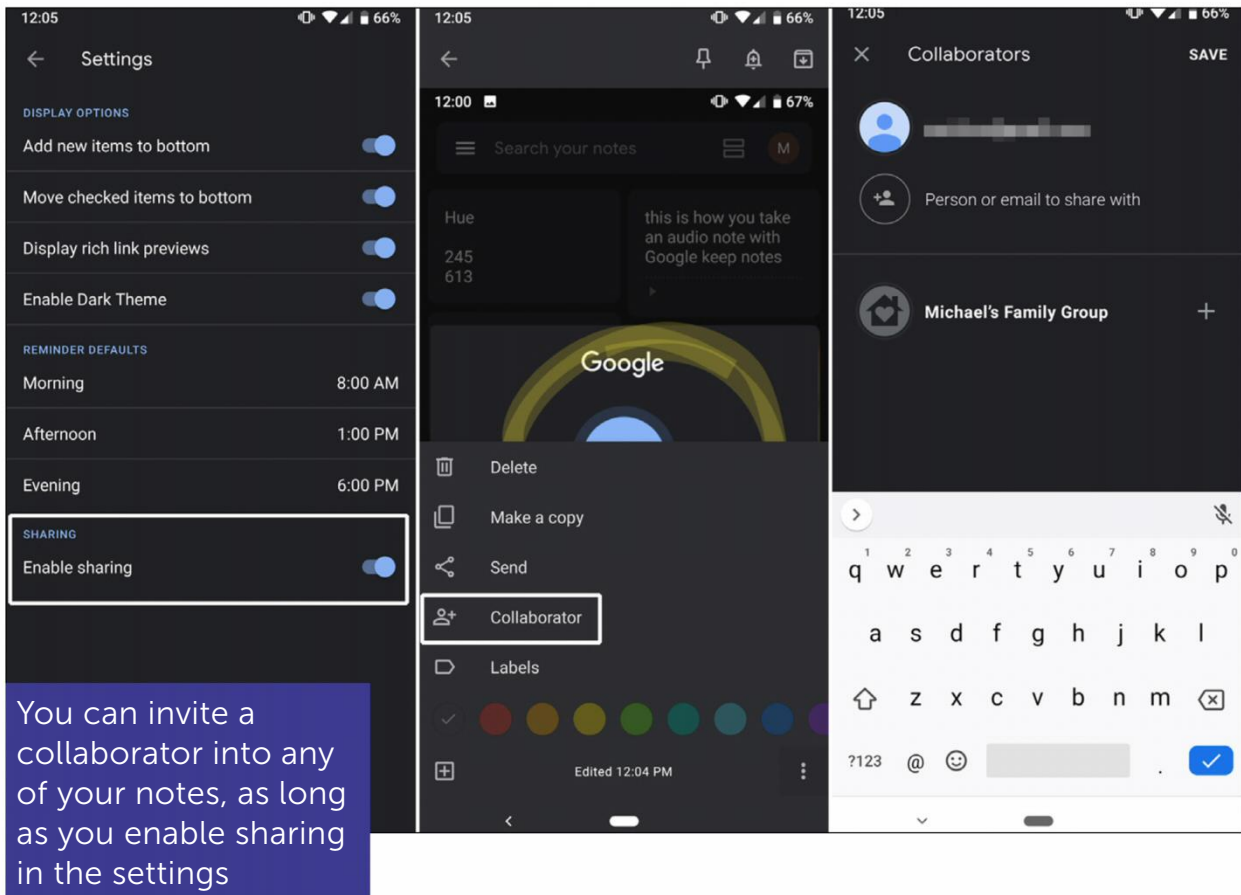
If you've ever emailed yourself the text of a note just so you can use it in a document or a presentation, this will save you some time: Google Keep Notes is fully integrated into Google's office suite. And it couldn't be easier to get them in sync. When you have a file open in Docs or Slides, just tap the Keep logo in the sidebar at the right to see a list of your saved notes. Tap one to open it, and you can copy, cut, or edit anything that's inside. Of course, any changes you make will be synced back to Keep Notes on your phone. And if you simply want to create a Google document out of a note, just long-press on a note and select Copy to Google Docs.

5. Collaborate with a friend or colleague

Most of your Google Keep notes will probably be for your eyes only, but it's also easy to invite someone else to collaborate. First, you'll need to turn on sharing inside the Settings in the sidebar. Just tap the three-dot menu at the bottom of the screen when you're in a note and select Collaborator. From there you'll be able to select anyone from your address book to link your note with their Google Keep app. Whenever it's edited, you'll be notified (and vice versa).

6. Get the Chrome extension

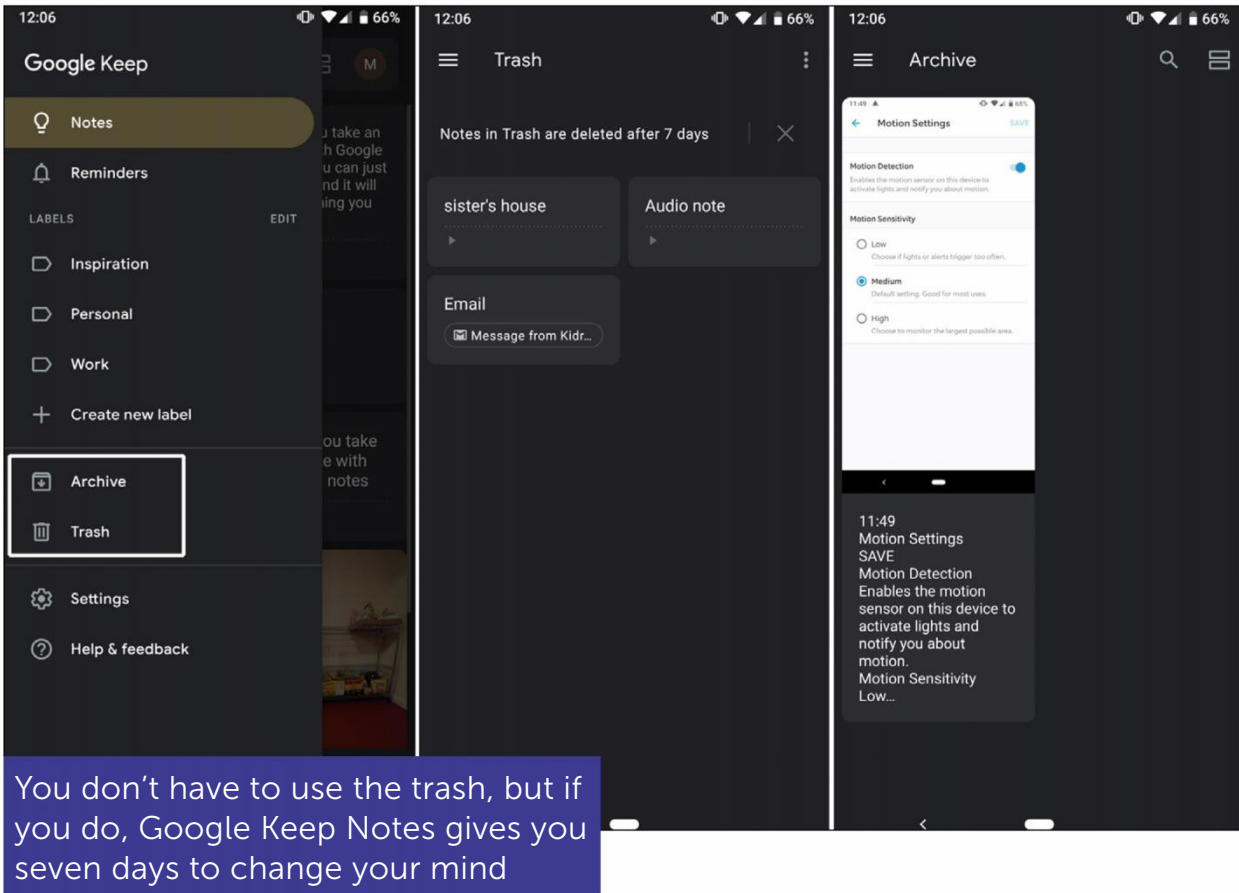
While any browser will let you log into Google Keep Notes to get work done, only the Chrome extension will let you use it like a digital locker. Download it from the Chrome Web Store, and it will put a small Keep icon next to your address bar that provides a



direct link to your account. While you're browsing or working in Chrome you'll be able to save URLs, photos, and text, and of course take notes.

7. Organize your notes with labels, colours, and pins

If you take a lot of notes, your Google Keep home screen can quickly get as cluttered as your inbox. But just like Gmail, you can easily organize it. If you long-press on a note, you'll bring up a series of options to help you find it later, including the ability to colour-code it, pin it to the top of the list, or apply a custom label.



8. Set a time or location reminder for a note

Google has a dedicated reminders app called Tasks, but if you don't want another app on your phone, you can set alerts for your notes so they act like reminders. Just tap the bell icon when you're in a note and you'll be able to set a reminder for a specific date and time, or a location, for example if you want to remember to pick up milk on the way home.

9. Recover a deleted note

Okay, this isn't exactly a hidden feature, but you might not have noticed it before. If you accidentally

delete a note – or just realize you needed something in it – you can still recover it from the trash within seven days of deletion. Or, if you’re unsure whether you’ll need a note later but still want to get it off the home screen, you can just use the Archive feature instead of delete. That will remove the notes from your library and store it in the Archive folder, which is accessible in the sidebar.

10. Create a note out of an email

If you want to create a note out of an email, you can either copy the text and paste it into a new note, or use the handy shortcut in Gmail on the web. Here’s how to do it: after you open an email, click the Keep Notes icon in the sidebar to the right. Next, click the Take a Note button, and your email will appear as an attachment inside your new note. Give it a name, select Done when you’re finished, and you’ll be able to jump right to your email with a tap.